

---

# **RSqueak/VM Documentation**

**Software Architecture Group (Hasso Plattner Institute)**

**Aug 02, 2019**



---

## Contents:

---

<b>1</b>	<b>Building from Source</b>	<b>1</b>
1.1	Common to all systems . . . . .	1
1.2	Windows . . . . .	1
1.3	Linux . . . . .	1
1.4	macOS . . . . .	1
<b>2</b>	<b>Development</b>	<b>3</b>
2.1	run.py . . . . .	3
2.2	unittests.py . . . . .	4
2.3	jittests.py . . . . .	4
2.4	jit.py . . . . .	4
2.5	shell.py . . . . .	4
<b>3</b>	<b>rsqueakvm package</b>	<b>5</b>
3.1	Subpackages . . . . .	5
3.2	Submodules . . . . .	38
3.3	rsqueakvm.constants module . . . . .	38
3.4	rsqueakvm.display module . . . . .	38
3.5	rsqueakvm.error module . . . . .	40
3.6	rsqueakvm.interpreter module . . . . .	41
3.7	rsqueakvm.interpreter_bytecodes module . . . . .	43
3.8	rsqueakvm.interpreter_debugging module . . . . .	44
3.9	rsqueakvm.key_constants module . . . . .	44
3.10	rsqueakvm.main module . . . . .	44
3.11	rsqueakvm.objspace module . . . . .	45
3.12	rsqueakvm.squeakimage module . . . . .	46
3.13	rsqueakvm.storage module . . . . .	51
3.14	rsqueakvm.storage_classes module . . . . .	58
3.15	rsqueakvm.storage_contexts module . . . . .	59
3.16	rsqueakvm.wrapper module . . . . .	65
3.17	Module contents . . . . .	68
<b>4</b>	<b>Indices and tables</b>	<b>69</b>
	<b>Python Module Index</b>	<b>71</b>
	<b>Index</b>	<b>73</b>



### 1.1 Common to all systems

We have scripts for installing dependencies, building, running the unit tests, and running JIT tests in the *.build* sub-directory. You need the *PyPy* source tree, and the *rsdl* source tree. If you already have all these, run *.build/build.py -32bit* to build 32-bit VM. Run *.build/build.py* to compile a 64-bit VM. The script passes all other arguments on to the *rpython* translator, so you can pass other options.

It will generate a config file *.build/buildconfig.ini* where you can set your paths. You can also run *.build/download\_dependencies.py* to download the dependencies automatically. You will also need a Python and a C compiler for 32-bit compilation, if you plan to do 32-bit development.

### 1.2 Windows

On Windows, you will have to use the C compiler that comes with Visual Studio 2008, because newer ones crash the JIT. It suffices to just install the [Microsoft C compiler V90 plus Windows SDK 7](#). Also, install the [Python 2.7 Visual Studio compiler package](#). The packages provided in the link install it to the default paths. If you already have the compiler and SDK, you can also just update the paths in *.build/buildconfig.ini*.

### 1.3 Linux

RSqueak/VM can currently be compiled in both 32-bit and 64-bit configurations. For 32-bit, you need to use 32-bit python and SDL2 using 32-bit libraries for everything. The easiest way to ensure that is to use a chroot, but you can also install the *:i386* versions of the SDL2 dependencies for your distro.

### 1.4 macOS

To compile RSqueak/VM for 32-bit, run

```
export VERSIONER_PYTHON_PREFER_32_BIT=yes
```

before you run any of the python scripts in the *.build* directory. You also need to download SDL2 as a framework (homebrew version is not tested). Check the *.travis/build-osx.sh* if you get stuck anywhere.

The *.build* directory includes several scripts that make development easier. Once you've setup your system for building, you can use these to work on the RSqueak/VM.

### 2.1 run.py

This script executes RSqueak/VM in *hosted* mode, that is, it runs on top of a Python interpreter. This is very slow (we recommend using PyPy), but it can be useful to debug specific aspects of the VM quickly. Ideally, you set up an image so that it executes the code that you are interested in early during startup (*DisplayScreen class>>startUp* is a good candidate) and then you add your breakpoints to the source. You can also pass commandline arguments to the script or tweak the default arguments in the script itself.

#### *Running a "Smalltalk REPL"*

When you want to work on primitives or plugins, it is useful to prepare an image a little (for example, make it so test runs print to the console), and then run the following:

```
pypy .build/run.py --shell <PATH_TO_IMAGE>
```

This will load the image and dump you in a simple REPL for Smalltalk, but with some commands to help you execute Python code and, in particular, to reload the Python code you write in any plugin or primitive file. Thus, you can run some Smalltalk code, check for errors, change the primitive code, reload it, and try again. This avoids having to reload the image in interpreted mode all the time (which can be slow).

There is an integrated help that you can get by typing `!help`, and there is limited autocomplete, too.

Note that the REPL only loads the image, but does not process startup. For many things, you might want to run *FileStream startUp: true* or *Delay startUp* to get basic I/O working or delays working.

## 2.2 unittests.py

The second script that is useful for working on issues regarding the interpreter is *unittests.py*. By default it runs all tests under the *rsqueakvm/test* directory (but not those in *rsqueakvm/test/jittest/*). This is a standalone pytest script, so you can pass arguments or select single test files as you would for pytest.

## 2.3 jittests.py

This script requires that you have already built an *rsqueak* binary and that you have the C Squeak VM installed. It executes the tests in *rsqueakvm/test/jittest/* and checks for the JIT output. We use these tests to ensure that development on the VM does not break JIT optimizations.

## 2.4 jit.py

This script is useful to figure out what the JIT is doing. Like *run.py*, it executes the RSqueak/VM in hosted mode, but this time it also simulates the JIT. This is even slower, but allows us to test small code snippets without having to retranslate the entire VM. The code snippets are configured directly in the file. When you run it, it does part of the translation process (but only enough to execute your specific code) and then runs the code. When the JIT kicks in, the compiled loop is shown in a PyGame window. You can then inspect it at your leisure and when you quit the window, the code continues executing. In order for this to work, you need to have *pygame* and *graphviz* installed and in your PATH.

## 2.5 shell.py

This script sets all the environment variables as if for translating the VM, and then drops you into an interactive Python prompt. You can type *terminal()* to drop into a system shell (*%COMSPEC%* on Windows *\$SHELL* or */bin/sh* on Unices) which then has all the environment variables set up that you need to do manual partial translations or similar things.



## 3.1 Subpackages

### 3.1.1 rsqueakvm.model package

#### Submodules

#### rsqueakvm.model.base module

```
class W_AbstractObjectWithClassReference (space, w_class)
    Bases: rsqueakvm.model.base.W_AbstractObjectWithIdentityHash
    Objects with arbitrary class (ie not CompiledMethod, SmallInteger or Float).
    change_class (space, w_class)
    fillin (space, g_self)
    getclass (space)
        Return Squeak class.
    guess_classname ()
        Get the name of the class of the receiver without using a space. If the shadow of the class of the receiver is
        not yet initialized, this might not return a correct name.
    invariant ()
    pointers_become_one_way (space, from_w, to_w)
    repr_classname = 'W_AbstractObjectWithClassReference'
    repr_content ()
    safe_getclass (space)
    w_class = None
```

**class W\_AbstractObjectWithIdentityHash**Bases: *rsqueakvm.model.base.W\_Object*

Object with explicit hash (ie all except small ints and floats).

**UNASSIGNED\_HASH** = 0**become** (*w\_other*)

Become swaps two objects. False means swapping failed

**can\_become** (*w\_other*)**fillin** (*space, g\_self*)**gethash** ()

Return 31-bit hash value.

**hash** = 0**invariant** ()**post\_become\_one\_way** (*w\_to*)**rehash** ()**repr\_classname** = 'W\_AbstractObjectWithIdentityHash'**setchar** (*n0, character*)**class W\_Object**Bases: *object*

Root of Squeak model, abstract.

**as\_repr\_string** ()**at0** (*space, index0*)

Access variable-sized part, as by Object&gt;&gt;at:.

Return value depends on layout of instance. Byte objects return bytes, word objects return words, pointer objects return pointers. Compiled method are treated special, if index0 within the literalsize returns pointer to literal, otherwise returns byte (ie byte code indexing starts at literalsize).

**atput0** (*space, index0, w\_value*)

Access variable-sized part, as by Object&gt;&gt;at:put:.

Semantics depend on layout of instance. Byte objects set bytes, word objects set words, pointer objects set pointers. Compiled method are treated special, if index0 within the literalsize sets pointer to literal, otherwise patches bytecode (ie byte code indexing starts at literalsize).

**become** (*other*)

Become swaps two objects. False means swapping failed

**bytes\_per\_slot** = 4**bytesize** ()

Return bytesize that conforms to Blue Book.

The reported size may differ from the actual size in Spy's object space, as memory representation varies depending on PyPy translation.

**change\_class** (*space, w\_class*)**class\_shadow** (*space*)

Return internal representation of Squeak class.

**classname** (*space*)  
Get the name of the class of the receiver

**clone** (*space*)

**fetch** (*space*, *n0*)  
Access fixed-size part, maybe also variable-sized part (we have to consult the Blue Book).

**fillin** (*space*, *g\_self*)

**fillin\_finalize** (*space*, *g\_self*)

**fillin\_weak** (*space*, *g\_self*)

**getclass** (*space*)  
Return Squeak class.

**gethash** ()  
Return 31-bit hash value.

**getword** (*n0*)

**guess\_classname** ()  
Get the name of the class of the receiver without using a space. If the shadow of the class of the receiver is not yet initialized, this might not return a correct name.

**has\_class** ()  
All Smalltalk objects should have classes. Unfortunately for bootstrapping the metaclass-cycle and during testing, that is not true for some W\_PointersObjects

**instsize** ()  
Return the number of slots of the object reserved for instance variables (not number of bytes). Only returns something non-zero for W\_PointersObjects, because all other classes in this model hierarchy represent varsized classes (except for SmallInteger).

**invariant** ()

**is\_array\_object** ()

**is\_class** (*space*)  
Return true, if the receiver seems to be a class. We can not be completely sure about this (non-class objects might be used as class).

**is\_nil** (*space*)  
Return True, if the receiver represents the nil object in the given Object Space.

**is\_positive** (*space*)

**is\_same\_object** (*other*)  
Compare object identity. This should be used instead of directly using `is` everywhere in the interpreter, in case we ever want to implement it differently (which is useful e.g. for proxies). Also, SmallIntegers and Floats need a different implementation.

**pointers\_become\_one\_way** (*space*, *from\_w*, *to\_w*)

**post\_become\_one\_way** (*w\_to*)

**repr\_classname** = 'W\_Object'

**repr\_content** ()

**safe\_getclass** (*space*)

**selector\_string** ()

**setword** (*n0*, *r\_uint\_value*)

**size()**

Return the number of “slots” or “items” in the receiver object. This means different things for different objects. For ByteObject, this means the number of bytes, for WordObject the number of words, for PointerObject the number of pointers (regardless if it’s varsized or not).

**store** (*space*, *n0*, *w\_value*)

Access fixed-size part, maybe also variable-sized part (we have to consult the Blue Book).

**str\_content()**

**trace\_pointers** (*space*)

**unwrap\_array** (*space*)

**unwrap\_char\_as\_byte** (*space*)

**unwrap\_float** (*space*)

**unwrap\_int** (*space*)

**unwrap\_int64** (*space*)

**unwrap\_rbigint** (*space*)

**unwrap\_string** (*space*)

**unwrap\_uint** (*space*)

**varsize()**

Return number of slots in the of variable-sized part (not number of bytes). Not necessarily number of bytes. Variable sized objects are those created with #new:.

**calculate\_and\_cache** (*w\_object*)

### rsqueakvm.model.block\_closure module

**class W\_BlockClosure** (*space*, *w\_outerctx*, *startpc*, *numArgs*, *size*, *stack=None*)

Bases: *rsqueakvm.model.base.W\_AbstractObjectWithIdentityHash*

**at0** (*space*, *index0*)

Access variable-sized part, as by Object>>at:.

Return value depends on layout of instance. Byte objects return bytes, word objects return words, pointer objects return pointers. Compiled method are treated special, if index0 within the literalsize returns pointer to literal, otherwise returns byte (ie byte code indexing starts at literalsize).

**atput0** (*space*, *index0*, *w\_value*)

Access variable-sized part, as by Object>>at:put:.

Semantics depend on layout of instance. Byte objects set bytes, word objects set words, pointer objects set pointers. Compiled method are treated special, if index0 within the literalsize sets pointer to literal, otherwise patches bytecode (ie byte code indexing starts at literalsize).

**bytes\_per\_slot** = 1

**changed()**

**clone** (*space*)

**create\_frame** (*space*, *arguments=[]*)

**empty\_stack** = []

**fetch** (*space*, *index0*)

Access fixed-size part, maybe also variable-sized part (we have to consult the Blue Book).

```

fetch_all (space)
fillin (space, g_self)
fillin_finalize (space, g_self)
get_stacksize ()
getclass (space)
    Return Squeak class.
instsize ()
    Return the number of slots of the object reserved for instance variables (not number of bytes). Only returns
    something non-zero for W_PointersObjects, because all other classes in this model hierarchy represent
    varsized classes (except for SmallInteger).
numArgs ()
pointers_become_one_way (space, from_w, to_w)
repr_classname = 'W_BlockClosure'
set_numArgs (numArgs)
set_stack (lst)
set_startpc (pc)
size ()
    Return the number of “slots” or “items” in the receiver object. This means different things for different
    objects. For ByteObject, this means the number of bytes, for WordObject the number of words, for
    PointerObject the number of pointers (regardless if it’s varsized or not).
startpc ()
store (space, index0, w_value)
    Access fixed-size part, maybe also variable-sized part (we have to consult the Blue Book).
store_all (space, lst_w)
tempsize ()
trace_pointers (space)
varsize ()
    Return number of slots in the of variable-sized part (not number of bytes). Not necessarily number of
    bytes. Variable sized objects are those created with #new:.
version = <rsqueakvm.util.version.Version object>
w_method ()
w_outerContext ()
w_receiver ()

```

### rsqueakvm.model.character module

```

class W_Character (value)
    Bases: rsqueakvm.model.base.W_AbstractObjectWithIdentityHash
    Boxed char value.

```

**at0** (*space, index0*)

Access variable-sized part, as by Object>>at:.

Return value depends on layout of instance. Byte objects return bytes, word objects return words, pointer objects return pointers. Compiled method are treated special, if index0 within the literalsizes returns pointer to literal, otherwise returns byte (ie byte code indexing starts at literalsizes).

**atput0** (*space, index0, w\_value*)

Access variable-sized part, as by Object>>at:put:.

Semantics depend on layout of instance. Byte objects set bytes, word objects set words, pointer objects set pointers. Compiled method are treated special, if index0 within the literalsizes sets pointer to literal, otherwise patches bytecode (ie byte code indexing starts at literalsizes).

**clone** (*space*)

**fetch** (*space, n0*)

Access fixed-size part, maybe also variable-sized part (we have to consult the Blue Book).

**fillin** (*space, g\_self*)

**getclass** (*space*)

Return Character from special objects array.

**gethash** ()

Return 31-bit hash value.

**guess\_classname** ()

Get the name of the class of the receiver without using a space. If the shadow of the class of the receiver is not yet initialized, this might not return a correct name.

**invariant** ()

**is\_same\_object** (*other*)

Compare object identity. This should be used instead of directly using is everywhere in the interpreter, in case we ever want to implement it differently (which is useful e.g. for proxies). Also, SmallIntegers and Floats need a different implementation.

**repr\_classname** = 'W\_Character'

**size** ()

Return the number of “slots” or “items” in the receiver object. This means different things for different objects. For ByteObject, this means the number of bytes, for WordObject the number of words, for PointerObject the number of pointers (regardless if it’s varsized or not).

**store** (*space, n0, w\_obj*)

Access fixed-size part, maybe also variable-sized part (we have to consult the Blue Book).

**str\_content** ()

**unwrap\_char\_as\_byte** (*space*)

## rsqueakvm.model.compiled\_methods module

**class CompiledMethodHeader** (*header\_word*)

Bases: object

**class SpurCompiledMethodHeader** (*header\_word*)

Bases: *rsqueakvm.model.compiled\_methods.CompiledMethodHeader*

**static has\_primitive\_bit\_set** (*header\_word*)

```
class V3CompiledMethodHeader (header_word)
    Bases: rsqueakvm.model.compiled_methods.CompiledMethodHeader
```

```
class W_CompiledMethod (space, bytecount=0, header=0)
    Bases: rsqueakvm.model.base.W_AbstractObjectWithIdentityHash
```

My instances are methods suitable for interpretation by the virtual machine. This is the only class in the system whose instances intermix both indexable pointer fields and indexable integer fields.

The current format of a CompiledMethod is as follows:

header (4 bytes) literals (4 bytes each) bytecodes (variable)

An optional method trailer can be part of the bytecodes part.

**as\_string** (*markBytecode=0*)

**at0** (*space, index0*)

**atput0** (*space, index0, w\_value*)

Access variable-sized part, as by Object>>at:put:.

Semantics depend on layout of instance. Byte objects set bytes, word objects set words, pointer objects set pointers. Compiled method are treated special, if index0 within the literalsize sets pointer to literal, otherwise patches bytecode (ie byte code indexing starts at literalsize).

**bytecode\_string** (*markBytecode=0*)

**bytecodeoffset** ()

**bytes\_per\_slot** = 1

**clone** (*space*)

**compiled\_in** ()

**compute\_frame\_size** ()

**constant\_compiledin\_class** ()

**constant\_lookup\_class** ()

**create\_frame** (*space, receiver, arguments=[], s\_fallback=None*)

**end\_pc** ()

**fetch\_bytecode** (*pc*)

**fillin** (*space, g\_self*)

**get\_identifier\_string** ()

**getbytes** ()

**getclass** (*space*)

Return Squeak class.

**getheader** ()

**getliteral** (*index*)

**getliteralsize** ()

**guess\_classname** ()

Get the name of the class of the receiver without using a space. If the shadow of the class of the receiver is not yet initialized, this might not return a correct name.

**guess\_containing\_classname** ()

```
headersize ()
initialize_literals (number_of_literals, space, initializing=False)
invariant ()
is_array_object ()
literalat0 (space, index0)
literalatput0 (space, index0, w_value, initializing=False)
lookup_class = None
lookup_selector = '<unknown>'
pointers_become_one_way (space, from_w, to_w)
post_init ()
primitive ()
repr_classname = 'W_CompiledMethod'
safe_compiled_in ()
safe_identifier_string ()
set_lookup_class_and_name (w_class, selector)
setbytes (bytes)
setchar (index0, character)
setheader (space, header, initializing=False)
setliteral (index, w_lit)
setliterals (literals)
size ()
store (space, index0, w_v)
    Access fixed-size part, maybe also variable-sized part (we have to consult the Blue Book).
str_content ()
tempsize ()
trace_pointers (space)
update_compiledin_class_from_literals ()

class W_PreSpurCompiledMethod (space, bytecount=0, header=0)
    Bases: rsqueakvm.model.compiled_methods.W_CompiledMethod
    setheader (space, header, initializing=False)

class W_SpurCompiledMethod (space, bytecount=0, header=0)
    Bases: rsqueakvm.model.compiled_methods.W_CompiledMethod
    Handles the specialities of the method header in Spur
    setbytes (bytes)
    setchar (index0, character)
    setheader (space, header, initializing=False)
    update_primitive_index ()
```



**rsqueakvm.model.display module**

```

class W_16BitDisplayBitmap (space, size, depth)
    Bases: rsqueakvm.model.display.W_DirectDisplayBitmap

    getword (n)

    repr_classname = 'W_16BitDisplayBitmap'

    setword (n, word)

    swap_pixels (word)

class W_32BitDisplayBitmap (space, size, depth)
    Bases: rsqueakvm.model.display.W_DirectDisplayBitmap

    repr_classname = 'W_32BitDisplayBitmap'

class W_DirectDisplayBitmap (space, size, depth)
    Bases: rsqueakvm.model.display.W_DisplayBitmap

    force_rectangle_to_screen (left, right, top, bottom)

    repr_classname = 'W_DirectDisplayBitmap'

class W_DisplayBitmap (space, size, depth)
    Bases: rsqueakvm.model.base.W_AbstractObjectWithIdentityHash

    at0 (space, index0)
        Access variable-sized part, as by Object>>at:.

        Return value depends on layout of instance. Byte objects return bytes, word objects return words, pointer
        objects return pointers. Compiled method are treated special, if index0 within the literalsize returns pointer
        to literal, otherwise returns byte (ie byte code indexing starts at literalsize).

    atput0 (space, index0, w_value)
        Access variable-sized part, as by Object>>at:put:.

        Semantics depend on layout of instance. Byte objects set bytes, word objects set words, pointer objects
        set pointers. Compiled method are treated special, if index0 within the literalsize sets pointer to literal,
        otherwise patches bytecode (ie byte code indexing starts at literalsize).

    can_become (w_other)
        TODO implement _become() for this class. Impossible due to _immutable_fields_?

    clone (space)

    display ()

    flush_to_screen ()

    getclass (space)
        Return Squeak class.

    getword (n)

    guess_classname ()
        Get the name of the class of the receiver without using a space. If the shadow of the class of the receiver is
        not yet initialized, this might not return a correct name.

    invariant ()

    is_array_object ()

    relinquish_display ()

```

```
repr_classname = 'W_DisplayBitmap'
repr_content ()
setword (n, word)
setwords (lst)
size ()
    Return the number of “slots” or “items” in the receiver object. This means different things for different objects. For ByteObject, this means the number of bytes, for WordObject the number of words, for PointerObject the number of pointers (regardless if it’s varsized or not).
take_over_display ()
unwrap_string (space)
class W_MappingDisplayBitmap (space, size, depth)
    Bases: rsqueakvm.model.display.W_DisplayBitmap
    force_rectangle_to_screen (left, right, top, bottom)
    repr_classname = 'W_MappingDisplayBitmap'
    set_pixelbuffer_word (n, word)
    take_over_display ()
    word_from_pixel (x, y)
from_words_object (w_obj, form)
```

### rsqueakvm.model.numeric module

```
class W_AbstractFloat (value)
    Bases: rsqueakvm.model.base.W_AbstractObjectWithIdentityHash
    at0 (space, index0)
        Access variable-sized part, as by Object>>at:.
        Return value depends on layout of instance. Byte objects return bytes, word objects return words, pointer objects return pointers. Compiled method are treated special, if index0 within the literalsize returns pointer to literal, otherwise returns byte (ie byte code indexing starts at literalsize).
    atput0 (space, index0, w_value)
        Access variable-sized part, as by Object>>at:put:.
        Semantics depend on layout of instance. Byte objects set bytes, word objects set words, pointer objects set pointers. Compiled method are treated special, if index0 within the literalsize sets pointer to literal, otherwise patches bytecode (ie byte code indexing starts at literalsize).
    clone (space)
    fetch (space, n0)
        Access fixed-size part, maybe also variable-sized part (we have to consult the Blue Book).
    fillin (space, g_self)
    fillin_fromwords (space, high, low)
    getclass (space)
        Return Float from special objects array.
    gethash ()
        Return 31-bit hash value.
```

```

getvalue ()

guess_classname ()
    Get the name of the class of the receiver without using a space. If the shadow of the class of the receiver is
    not yet initialized, this might not return a correct name.

is_same_object (other)
    Compare object identity. This should be used instead of directly using is everywhere in the interpreter, in
    case we ever want to implement it differently (which is useful e.g. for proxies). Also, SmallIntegers and
    Floats need a different implementation.

setvalue (v)

size ()
    Return the number of “slots” or “items” in the receiver object. This means different things for different
    objects. For ByteObject, this means the number of bytes, for WordObject the number of words, for
    PointerObject the number of pointers (regardless if it’s varsized or not).

store (space, n0, w_obj)
    Access fixed-size part, maybe also variable-sized part (we have to consult the Blue Book).

str_content ()

unwrap_float (space)

unwrap_string (space)

class W_Float (value)
    Bases: rsqueakvm.model.numeric.W_AbstractFloat
    Boxed float value.

    fillin_fromwords (space, high, low)

    getvalue ()

    repr_classname = 'W_Float'

    setvalue (v)

    store (space, n0, w_obj)
        Access fixed-size part, maybe also variable-sized part (we have to consult the Blue Book).

class W_LargeInteger (space, w_class)
    Bases: rsqueakvm.model.base.W_AbstractObjectWithClassReference

    bytes_per_slot = 1

    is_array_object ()

    is_positive (space)

    repr_classname = 'W_LargeInteger'

class W_LargeIntegerBig (space, w_class, value, size=0)
    Bases: rsqueakvm.model.numeric.W_LargeInteger
    Large integer using rbigints

    at0 (space, n0)
        Access variable-sized part, as by Object>>at:.

        Return value depends on layout of instance. Byte objects return bytes, word objects return words, pointer
        objects return pointers. Compiled method are treated special, if index0 within the literalsize returns pointer
        to literal, otherwise returns byte (ie byte code indexing starts at literalsize).

```

**atput0** (*space*, *n0*, *w\_value*)

Access variable-sized part, as by Object>>at:put:.

Semantics depend on layout of instance. Byte objects set bytes, word objects set words, pointer objects set pointers. Compiled method are treated special, if index0 within the literalsizes sets pointer to literal, otherwise patches bytecode (ie byte code indexing starts at literalsizes).

**clone** (*space*)

**fillin** (*space*, *g\_self*)

**repr\_classname** = 'W\_LargeIntegerBig'

**size** ()

Return the number of “slots” or “items” in the receiver object. This means different things for different objects. For ByteObject, this means the number of bytes, for WordObject the number of words, for PointerObject the number of pointers (regardless if it’s varsized or not).

**str\_content** ()

**unwrap\_float** (*space*)

**unwrap\_int** (*space*)

**unwrap\_int64** (*space*)

**unwrap\_long\_untranslated** (*space*)

**unwrap\_rbigint** (*space*)

**unwrap\_string** (*space*)

**unwrap\_uint** (*space*)

**class W\_LargeIntegerWord** (*space*, *w\_class*, *value*, *size*)

Bases: *rsqueakvm.model.numeric.W\_LargeInteger*

**at0** (*space*, *n0*)

Access variable-sized part, as by Object>>at:.

Return value depends on layout of instance. Byte objects return bytes, word objects return words, pointer objects return pointers. Compiled method are treated special, if index0 within the literalsizes returns pointer to literal, otherwise returns byte (ie byte code indexing starts at literalsizes).

**atput0** (*space*, *n0*, *w\_value*)

Access variable-sized part, as by Object>>at:put:.

Semantics depend on layout of instance. Byte objects set bytes, word objects set words, pointer objects set pointers. Compiled method are treated special, if index0 within the literalsizes sets pointer to literal, otherwise patches bytecode (ie byte code indexing starts at literalsizes).

**clone** (*space*)

**fillin** (*space*, *g\_self*)

**repr\_classname** = 'W\_LargeIntegerWord'

**size** ()

Return the number of “slots” or “items” in the receiver object. This means different things for different objects. For ByteObject, this means the number of bytes, for WordObject the number of words, for PointerObject the number of pointers (regardless if it’s varsized or not).

**str\_content** ()

**unwrap\_float** (*space*)

```

unwrap_int64 (space)

unwrap_long_untranslated (space)

unwrap_rbigint (space)

unwrap_string (space)

unwrap_uint (space)

class W_MutableFloat (value)
    Bases: rsqueakvm.model.numeric.W_AbstractFloat

    Balloon frequently converts 32-bit words into Floats from within the image. If we give a normal W_Float and let
    Balloon mutate the words to fill it in, we always have to abort any trace because we're forcing a quasi-immutable.
    So just for those cases where someone in the image is creating floats using 'new' (in storage_classes.py), we
    use W_MutableFloat instances, which do not declare they're value as quasi-immutable.

    getvalue ()

    repr_classname = 'W_MutableFloat'

    setvalue (v)

    store (space, n0, w_obj)
        Floats are stored in big-endian (PowerPC) order

class W_MutableSmallInteger (value)
    Bases: rsqueakvm.model.numeric.W_SmallInteger

    set_value (v)

    value

class W_SmallInteger (value)
    Bases: rsqueakvm.model.base.W_Object

    Boxed integer value

    clone (space)

    fillin (space, g_self)
        This is only called for Large Integers that for us fit in SmallIntegers

    getclass (space)
        Return Squeak class.

    gethash ()
        Return 31-bit hash value.

    guess_classname ()
        Get the name of the class of the receiver without using a space. If the shadow of the class of the receiver is
        not yet initialized, this might not return a correct name.

    invariant ()

    is_positive (space)

    is_same_object (other)
        Compare object identity. This should be used instead of directly using is everywhere in the interpreter, in
        case we ever want to implement it differently (which is useful e.g. for proxies). Also, SmallIntegers and
        Floats need a different implementation.

    repr_classname = 'W_SmallInteger'

    str_content ()

```

```
unwrap_char_as_byte (space)
unwrap_float (space)
unwrap_int (space)
unwrap_int64 (space)
unwrap_long_untranslated (space)
unwrap_rbigint (space)
unwrap_uint (space)
value
calculate_exposed_size_for_big_int (value)
```

### rsqueakvm.model.pointers module

```
class W_PointersObject (space, w_class, size, weak=False)
    Bases: rsqueakvm.model.base.W_AbstractObjectWithIdentityHash
    Common object.

    as_cached_object_get_shadow (space)
    as_class_get_shadow (space)
    as_context_get_shadow (space)
    as_methoddict_get_shadow (space)
    as_observed_get_shadow (space)
    as_special_get_shadow (space, TheClass)
    assert_strategy ()
    at0 (space, index0)
        Access variable-sized part, as by Object>>at:.

        Return value depends on layout of instance. Byte objects return bytes, word objects return words, pointer
        objects return pointers. Compiled method are treated special, if index0 within the literalsize returns pointer
        to literal, otherwise returns byte (ie byte code indexing starts at literalsize).

    atput0 (space, index0, w_value)
        Access variable-sized part, as by Object>>at:put:.

        Semantics depend on layout of instance. Byte objects set bytes, word objects set words, pointer objects
        set pointers. Compiled method are treated special, if index0 within the literalsize sets pointer to literal,
        otherwise patches bytecode (ie byte code indexing starts at literalsize).

    change_class (space, w_class)
    clone (space)
    fetch (space, n0)
        Access fixed-size part, maybe also variable-sized part (we have to consult the Blue Book).
    fetch_all (space)
    fillin (space, g_self)
    fillin_weak (space, g_self)
```

**getclass** (*space*)  
Return Squeak class.

**guess\_classname** ()  
Get the name of the class of the receiver without using a space. If the shadow of the class of the receiver is not yet initialized, this might not return a correct name.

**has\_class** ()  
All Smalltalk objects should have classes. Unfortunately for bootstrapping the metaclass-cycle and during testing, that is not true for some W\_PointersObjects

**has\_space** ()

**has\_strategy** ()

**instsize** ()  
Return the number of slots of the object reserved for instance variables (not number of bytes). Only returns something non-zero for W\_PointersObjects, because all other classes in this model hierarchy represent varsized classes (except for SmallInteger).

**invariant** ()

**is\_class** (*space*)  
Return true, if the receiver seems to be a class. We can not be completely sure about this (non-class objects might be used as class).

**is\_weak** ()

**pointers\_become\_one\_way** (*space, from\_w, to\_w*)

**repr\_classname** = 'W\_PointersObject'

**repr\_content** ()

**safe\_getclass** (*space*)

**size** ()  
Return the number of “slots” or “items” in the receiver object. This means different things for different objects. For ByteObject, this means the number of bytes, for WordObject the number of words, for PointerObject the number of pointers (regardless if it’s varsized or not).

**space** ()

**store** (*space, n0, w\_value*)  
Access fixed-size part, maybe also variable-sized part (we have to consult the Blue Book).

**store\_all** (*space, collection*)

**store\_strategy** (*strategy*)

**strategy** = None

**trace\_pointers** (*space*)

**unwrap\_array** (*space*)

**unwrap\_char** (*space*)

### rsqueakvm.model.variable module

**class W\_BytesObject** (*space, w\_class, size*)  
Bases: *rsqueakvm.model.base.W\_AbstractObjectWithClassReference*

**at0** (*space, index0*)

Access variable-sized part, as by Object>>at:.

Return value depends on layout of instance. Byte objects return bytes, word objects return words, pointer objects return pointers. Compiled method are treated special, if index0 within the literalsize returns pointer to literal, otherwise returns byte (ie byte code indexing starts at literalsize).

**atput0** (*space, index0, w\_value*)

Access variable-sized part, as by Object>>at:put:.

Semantics depend on layout of instance. Byte objects set bytes, word objects set words, pointer objects set pointers. Compiled method are treated special, if index0 within the literalsize sets pointer to literal, otherwise patches bytecode (ie byte code indexing starts at literalsize).

**bytes\_per\_slot** = 1

**clone** (*space*)

**fillin** (*space, g\_self*)

**getbytes** ()

**getchar** (*n0*)

**getrbigint** ()

**invariant** ()

**is\_array\_object** ()

**is\_positive** (*space*)

**mutate** ()

**repr\_classname** = 'W\_BytesObject'

**selector\_string** ()

**setbytes** (*lst*)

**setchar** (*n0, character*)

**short\_at0** (*space, index0*)

**short\_atput0** (*space, index0, w\_value*)

**size** ()

Return the number of “slots” or “items” in the receiver object. This means different things for different objects. For ByteObject, this means the number of bytes, for WordObject the number of words, for PointerObject the number of pointers (regardless if it’s varsized or not).

**str\_content** ()

**unwrap\_int64** (*space*)

**unwrap\_long\_untranslated** (*space*)

**unwrap\_rbigint** (*space*)

**unwrap\_string** (*space*)

**unwrap\_uint** (*space*)

**class W\_WordsObject** (*space, w\_class, size*)

Bases: *rsqueakvm.model.base.W\_AbstractObjectWithClassReference*



**at0** (*space, index0*)

Access variable-sized part, as by Object>>at:.

Return value depends on layout of instance. Byte objects return bytes, word objects return words, pointer objects return pointers. Compiled method are treated special, if index0 within the literalsize returns pointer to literal, otherwise returns byte (ie byte code indexing starts at literalsize).

**atput0** (*space, index0, w\_value*)

Access variable-sized part, as by Object>>at:put:.

Semantics depend on layout of instance. Byte objects set bytes, word objects set words, pointer objects set pointers. Compiled method are treated special, if index0 within the literalsize sets pointer to literal, otherwise patches bytecode (ie byte code indexing starts at literalsize).

**clone** (*space*)

**convert\_to\_bytes\_layout** (*wordsize*)

**fillin** (*space, g\_self*)

**getchar** (*n0*)

**getword** (*n*)

**getwords** ()

**invariant** ()

**is\_array\_object** ()

**repr\_classname** = 'W\_WordsObject'

**setchar** (*n0, character*)

**setword** (*n, word*)

**setwords** (*lst*)

**short\_at0** (*space, index0*)

**short\_atput0** (*space, index0, w\_value*)

**size** ()

Return the number of “slots” or “items” in the receiver object. This means different things for different objects. For ByteObject, this means the number of bytes, for WordObject the number of words, for PointerObject the number of pointers (regardless if it’s varsized or not).

**unwrap\_string** (*space*)

## Module contents

Squeak model.

**W\_Object**

**W\_SmallInteger** W\_MutableSmallInteger

**W\_AbstractObjectWithIdentityHash**

**W\_AbstractFloat** W\_Float W\_MutableFloat

W\_Character W\_PointersObject W\_AbstractObjectWithClassReference

**W\_LargeInteger** W\_LargeIntegerWord W\_LargeIntegerBig

W\_BytesObject W\_WordsObject

W\_CompiledMethod W\_SpurCompiledMethod W\_PreSpurCompiledMethod

### 3.1.2 rsqueakvm.plugins package

#### Subpackages

#### rsqueakvm.plugins.database package

#### Submodules

#### rsqueakvm.plugins.database.model module

```
class DBType
    Bases: object

class WDBObject (space, w_class, size, weak=False, w_id=None, cache=None)
    Bases: rsqueakvm.model.pointers.W_PointersObject

    class_name (space)

    fetch (space, n0)
        Access fixed-size part, maybe also variable-sized part (we have to consult the Blue Book).

    is_same_object (other)
        Compare object identity. This should be used instead of directly using is everywhere in the interpreter, in
        case we ever want to implement it differently (which is useful e.g. for proxies). Also, SmallIntegers and
        Floats need a different implementation.

    static next_id()

    repr_classname = 'WDBObject'

    state = <rsqueakvm.plugins.database.model.WDBObject_State instance>

    store (space, n0, w_value)
        Access fixed-size part, maybe also variable-sized part (we have to consult the Blue Book).

class WDBObject_State

    create_table_if_neccessary (space, class_name, connection)

    get_column_type (class_name, n0)

    get_column_types (class_name)

    init_column_types_if_neccessary (class_name, size)

    set_column_type (class_name, position, value)

alter_sql (class_name, n0, dbtype)

create_sql (class_name)

insert_sql (class_name)

select_sql (class_name, n0)

update_sql (class_name, n0)
```

## Module contents

**class CConfig**

```
SQLITE_BLOB = None
SQLITE_DONE = None
SQLITE_FLOAT = None
SQLITE_INTEGER = None
SQLITE_NULL = None
SQLITE_ROW = None
SQLITE_TEXT = None
```

**class DBManager**

Bases: object

```
close(db_pointer)
connect(db_class, filename)
connection()
cursor(cursor_handle)
execute(space, db, sql, args=None)
get_connection(db_handle)
```

**class SQLConnection(*db\_class, filename*)**

Bases: object

```
close()
connect(db_class, filename)
cursor()
execute(space, sql, args=None)
```

**class SQLCursor(*connection*)**

Bases: object

```
bind_query_argument(space, w_value, query, i)
close()
execute(space, sql, args=None)
next(space)
raw_next(space)
```

**class Statement(*w\_connection, sql*)**

Bases: object

```
close()
```

**class StatementCache(*w\_connection*)**

Bases: object

```
all_statements()
get_holder(sql)
```

`get_or_make (sql)`

`invalidate ()`

**class** `StatementHolder`

Bases: `object`

### rsqueakvm.plugins.immutability package

#### Submodules

#### rsqueakvm.plugins.immutability.bytes module

Immutable `W_BytesObject` Implementation.

**class** `W_Immutable_BytesObject (space, w_cls, bytes)`

Bases: *rsqueakvm.model.variable.W\_BytesObject*

*W\_BytesObject* subclass with immutable bytes.

#### rsqueakvm.plugins.immutability.pointers module

Immutable `W_PointersObject` Implementation.

##### **POINTERS\_CLASSES**

A list of all immutable `W_PointersObject` subclasses. The position of each class in the list correlates to its number of storage slots (*0* no storage, *1* has one storage slot, ...). The last class in the list is an immutable `W_PointersObject` subclass with variable storage size.

##### **POINTERS\_CLASS\_ITER**

Unrolling iterable of *POINTERS\_CLASSES*.

##### **STORAGE\_ATTR\_TEMPLATE**

Storage attribute template.

##### **MAX\_FIXED\_SLOTS**

Number of immutable subclasses with fixed number of slots to generate.

**class** `W_AbstractImmutable_PointersObject (space, w_cls)`

Bases: *rsqueakvm.model.pointers.W\_PointersObject*

Abstract *W\_PointersObject* subclass for immutable pointers objects.

**class** `shadow (space)`

**Returns** Class shadow stored in *self.strategy* slot.

**fetch** (*space, n0*)

**Raises** `NotImplementedError`

**getclass** (*space*)

**Returns** Class from class shadow stored in *self.strategy* slot.

**size** ()

**Raises** `NotImplementedError`

**class W\_Immutable\_PointersObject** (*space, w\_cls, pointers\_w*)  
 Bases: *rsqueakvm.plugins.immutability.pointers.W\_AbstractImmutable\_PointersObject*  
*W\_PointersObject* subclass with immutable storage of variable size.

**fetch** (*space, n0*)  
 Raises *NotImplementedError*

**size** ()  
 Raises *NotImplementedError*

**generate\_fixed\_immutable\_subclass** (*n\_storage*)  
 Generate *W\_PointersObject* subclass with immutable storage of fixed size.

**Parameters** *n\_storage* – Number of storage slots.

**Returns** Immutable *W\_PointersObject* subclass with fixed slots.

**select\_immutable\_pointers\_class** (*storage*)  
 Select immutable *W\_PointersObject* subclass for a given pointers storage. If there is no immutable *W\_PointersObject* subclass with the right fixed storage size, it returns the immutable subclass with variable storage size.

**Parameters** *storage* – Pointers to store.

**Returns** Immutable *W\_PointersObject* subclass.

## rsqueakvm.plugins.immutability.words module

Immutable *W\_WordsObject* Implementation.

**class W\_Immutable\_WordsObject** (*space, w\_cls, words*)  
 Bases: *rsqueakvm.model.variable.W\_WordsObject*  
*W\_WordsObject* subclass with immutable words.

## Module contents

Base functions for ImmutabilityPlugin.

### WRITE\_OPERATIONS

A list of all write operations to be stubbed out by *immutable\_class(cls)* decorator.

**immutable\_class** (*cls*)  
 This function decorates classes, so that *is\_immutable* returns *True* and all *WRITE\_OPERATIONS* are implemented as NoOps.

**Parameters** *cls* – The target class.

**Returns** The decorated class.

**patch\_w\_object** ()  
 Add *W\_Object.is\_immutable* which by default returns *False*.

## rsqueakvm.plugins.vmdebugging package

### Submodules

#### rsqueakvm.plugins.vmdebugging.hooks module

##### **class JitIface**

Bases: `rpython.rlib.jit.JitHookInterface`

##### **after\_compile** (*debug\_info*)

A hook called after a loop has compiled assembler, called with JitDebugInfo instance. Overwrite for custom behavior

##### **after\_compile\_bridge** (*debug\_info*)

A hook called after a bridge is compiled, called with JitDebugInfo instance, overwrite for custom behavior

##### **before\_compile** (*debug\_info*)

A hook called after a loop is optimized, before compiling assembler, called with JitDebugInfo instance. Overwrite for custom behavior

##### **before\_compile\_bridge** (*debug\_info*)

A hook called before a bridge is compiled, but after optimizations are performed. Called with instance of debug\_info, overwrite for custom behavior

##### **on\_abort** (*reason, jitdriver, greenkey, greenkey\_repr, logops, operations*)

##### **on\_trace\_too\_long** (*jitdriver, greenkey, greenkey\_repr*)

##### **prepare\_abort** (*reason, jitdriver, greenkey, greenkey\_repr, logops, operations*)

##### **prepare\_compile\_hook** (*jitdriver, debug\_info, is\_bridge*)

##### **prepare\_trace\_too\_long** (*jitdriver, greenkey, greenkey\_repr*)

##### **wrapped\_compiled\_hook** (*jitdriver, debug\_info, is\_bridge*)

##### **make\_hook** (*args, func*)

#### rsqueakvm.plugins.vmdebugging.model module

##### **DebugMergePoint** (*space, name, repr\_of\_resop, jd\_name, call\_depth, call\_id, w\_greenkey*)

##### **GuardOp** (*space, name, offset, repr\_of\_resop, hash*)

##### **WrappedOp** (*space, name, offset, repr\_of\_resop*)

##### **method\_from\_greenkey** (*space, jitdriver, greenkey*)

##### **wrap\_debug\_info** (*space, debug\_info, is\_bridge=False*)

##### **wrap\_greenkey** (*space, jitdriver, greenkey, greenkey\_repr*)

##### **wrap\_oplist** (*space, logops, operations, ops\_offset=None*)

### Module contents

### Submodules

#### rsqueakvm.plugins.database\_plugin module

**rsqueakvm.plugins.file\_plugin module****class FilePlugin**Bases: *rsqueakvm.plugins.plugin.Plugin*

**primitiveDirectoryCreate** (*interp, s\_frame, w\_rcvr, dir\_path*)

**primitiveDirectoryDelete** (*interp, s\_frame, w\_rcvr, dir\_path*)

**primitiveDirectoryDelimiter** (*interp, s\_frame, w\_rcvr*)

**primitiveDirectoryLookup** (*interp, s\_frame, w\_file\_directory, full\_path, index*)

**primitiveDirectorySetMacTypeAndCreator** (*interp, s\_frame, w\_rcvr, filename, type, creator*)

**primitiveFileAtEnd** (*interp, s\_frame, w\_rcvr, fd*)

**primitiveFileClose** (*interp, s\_frame, w\_rcvr, fd*)

**primitiveFileDelete** (*interp, s\_frame, w\_rcvr, file\_path*)

**primitiveFileFlush** (*interp, s\_frame, w\_rcvr, fd*)

**primitiveFileGetPosition** (*interp, s\_frame, w\_rcvr, fd*)

**primitiveFileOpen** (*interp, s\_frame, w\_rcvr, file\_path, w\_writeable\_flag*)

**primitiveFileRead** (*interp, s\_frame, w\_rcvr, fd, target, start, count*)

**primitiveFileSetPosition** (*interp, s\_frame, w\_rcvr, fd, position*)

**primitiveFileSize** (*interp, s\_frame, w\_rcvr, fd*)

**primitiveFileStdioHandles** (*interp, s\_frame, w\_rcvr*)

**primitiveFileTruncate** (*interp, s\_frame, w\_rcvr, fd, position*)

**primitiveFileWrite** (*interp, s\_frame, w\_rcvr, fd, content, start, count*)

**smalltalk\_timestamp** (*space, sec\_since\_epoch*)

**rsqueakvm.plugins.immutability\_plugin module**

RSqueak/VM plugin which provides support for immutable objects.

Immutable objects can be created as copy of existing objects or from a list of arguments. The package *ImmutableObjects*, located in */repository*, needs to be loaded in the image.

**class ImmutabilityPlugin**Bases: *rsqueakvm.plugins.plugin.Plugin***setup** ()

Called when enabled during instantiation.

**primitiveImmutableFrom** (*interp, s\_frame, w\_cls, w\_obj*)

Creates an immutable copy of a given Smalltalk object.

**Parameters**

- **interp** – The interpreter proxy.
- **s\_frame** – The stack frame.
- **w\_cls** – The immutable objects target class.
- **w\_obj** – The Smalltalk object to produce an immutable copy from.

**Returns** An immutable copy of *w\_obj* with class *w\_cls*.

**Raises** PrimitiveFailedError

**primitiveImmutableFromArgs** (*interp*, *s\_frame*, *argcount*)

Returns an immutable instance of the receiver (which is a class) with all fields initialized with the arguments given.

**Parameters**

- **interp** – The interpreter proxy.
- **s\_frame** – The stack frame.
- **argcount** – The number of arguments.

**Returns** An immutable object.

**Raises** PrimitiveFailedError

**primitiveIsImmutable** (*interp*, *s\_frame*, *w\_rcvr*)

Tests if *w\_rcvr* is an immutable object.

**Parameters**

- **interp** – The interpreter proxy.
- **s\_frame** – The stack frame.
- **w\_rcvr** – The receiver object.

**Returns** *w\_true* if *w\_rcvr* is immutable object, otherwise *w\_false*.

## rsqueakvm.plugins.large\_integers module

**class LargeIntegers**

Bases: *rsqueakvm.plugins.plugin.Plugin*

**make\_func** (*name*, *primitive*)

**minimum\_bytelen\_for** (*val*)

**primDigitAdd** (*interp*, *s\_frame*, *rcvr*, *arg*)

**primDigitCompare** (*interp*, *s\_frame*, *rcvr*, *arg*)

**primDigitDivNegative** (*interp*, *s\_frame*, *rcvr*, *arg*, *neg*)

**primDigitMultiplyNegative** (*interp*, *s\_frame*, *rcvr*, *arg*, *neg*)

**primDigitSubtract** (*interp*, *s\_frame*, *rcvr*, *arg*)

**primNormalizeNegative** (*interp*, *s\_frame*, *w\_rcvr*)

**primNormalizePositive** (*interp*, *s\_frame*, *w\_rcvr*)

## rsqueakvm.plugins.locale\_plugin module

**class LocalePlugin**

Bases: *rsqueakvm.plugins.plugin.Plugin*

**primitiveCountry** (*interp*, *s\_frame*, *w\_rcvr*)

**primitiveLanguage** (*interp*, *s\_frame*, *w\_rcvr*)



**rsqueakvm.plugins.misc\_primitive\_plugin module****class MiscPrimitivePlugin**Bases: *rsqueakvm.plugins.plugin.Plugin***compare\_ascii** (*string1, string2*)**compare\_collated** (*string1, string2, order*)**is\_ascii\_order** (*w\_order*)**primitiveCompareString** (*interp, s\_frame, w\_rcvr, string1, string2, w\_order*)**primitiveIndexOfAsciiInString** (*interp, s\_frame, w\_rcvr, thechar, thebytes, start*)**primitiveStringHash** (*interp, s\_frame, w\_rcvr, thebytes, initialHash*)**rsqueakvm.plugins.plugin module****class Plugin**Bases: *object***call** (*name, interp, s\_frame, argcount, w\_method*)**expose\_primitive** (*wrap\_func=None, \*\*kwargs*)**is\_enabled** ()**is\_optional** ()**name** ()**patch** ()Called once in the beginning of *main.py* to patch interpreter.**setup** ()

Called when enabled during instantiation.

**static startup** (*space, argv*)

Called after image has been loaded and space has been set up.

**rsqueakvm.plugins.profiler\_plugin module****class LogFile**Bases: *object***close** ()**fileno** ()**isopen** ()**open** (*name*)**class ProfilerPlugin**Bases: *rsqueakvm.plugins.plugin.Plugin***is\_optional** ()**patch** ()Called once in the beginning of *main.py* to patch interpreter.

**setup()**

Called when enabled during instantiation.

**disableJitlog**(interp, s\_frame, w\_rcvr)

**disableProfiler**(interp, s\_frame, w\_rcvr)

**enableJitlog**(interp, s\_frame, w\_rcvr, fileno)

**enableProfiler**(interp, s\_frame, w\_rcvr, fileno, period)

**func**(interp, s\_frame, w\_rcvr)

**patch\_compiled\_method**()

**patch\_interpreter**()

### rsqueakvm.plugins.ruby\_plugin module

### rsqueakvm.plugins.simulation module

**class SimulationPlugin**

Bases: *rsqueakvm.plugins.plugin.Plugin*

**simulate**(w\_name, signature, interp, s\_frame, argcount, w\_method)

**simulateNumeric**(code, interp, s\_frame, argcount, w\_method)

### rsqueakvm.plugins.socket\_plugin module

**class SocketPlugin**

Bases: *rsqueakvm.plugins.plugin.Plugin*

**expose\_primitive**(wrap\_func=None, \*\*kwargs)

**get\_last\_lookup**()

**is\_socket**(space, w\_int)

**set\_last\_lookup**(v)

**static startup**(space, argv)

**class W\_SocketHandle**(family, socketType)

Bases: *rsqueakvm.model.base.W\_AbstractObjectWithIdentityHash*

**can\_read**()

**close**()

**connect**(w\_bytes, port)

**destroy**()

**getclass**(space)

Return Squeak class.

**guess\_classname**()

Get the name of the class of the receiver without using a space. If the shadow of the class of the receiver is not yet initialized, this might not return a correct name.

**isipv4**()

**isipv6**()

```

    make_socket ( )
    recv (count)
    repr_classname = 'W_SocketHandle'
    send (data)
ensure_socket (w_socket)
non_blocking_recv (self, count)
primitiveHasSocketAccess (interp, s_frame, w_rcvr)
primitiveInitializeNetwork (interp, s_frame, w_rcvr, w_semaphore)
primitiveResolverAbortLookup (interp, s_frame, argcount)
primitiveResolverAddressLookupResult (interp, s_frame, argcount)
primitiveResolverError (interp, s_frame, argcount)
primitiveResolverGetAddressInfo (interp, s_frame, argcount)
primitiveResolverGetAddressInfoFamily (interp, s_frame, argcount)
primitiveResolverGetAddressInfoNext (interp, s_frame, argcount)
primitiveResolverGetAddressInfoProtocol (interp, s_frame, argcount)
primitiveResolverGetAddressInfoResult (interp, s_frame, argcount)
primitiveResolverGetAddressInfoSize (interp, s_frame, argcount)
primitiveResolverGetAddressInfoType (interp, s_frame, argcount)
primitiveResolverGetNameInfo (interp, s_frame, argcount)
primitiveResolverGetNameInfoHostResult (interp, s_frame, argcount)
primitiveResolverGetNameInfoHostSize (interp, s_frame, argcount)
primitiveResolverGetNameInfoServiceResult (interp, s_frame, argcount)
primitiveResolverGetNameInfoServiceSize (interp, s_frame, argcount)
primitiveResolverHostNameResult (interp, s_frame, argcount)
primitiveResolverHostNameSize (interp, s_frame, argcount)
primitiveResolverLocalAddress (interp, s_frame, argcount)
primitiveResolverNameLookupResult (interp, s_frame, w_rcvr)
primitiveResolverStartAddressLookup (interp, s_frame, argcount)
primitiveResolverStartNameLookup (interp, s_frame, w_rcvr, hostname)
primitiveResolverStatus (interp, s_frame, w_rcvr)
primitiveSocketAbortConnection (interp, s_frame, argcount)
primitiveSocketAccept3Semaphores (interp, s_frame, argcount)
primitiveSocketAddressGetPort (interp, s_frame, argcount)
primitiveSocketAddressSetPort (interp, s_frame, argcount)
primitiveSocketBindTo (interp, s_frame, argcount)
primitiveSocketCloseConnection (interp, s_frame, w_rcvr, w_handle)

```

**primitiveSocketConnectTo** (*interp, s\_frame, argcount*)

**primitiveSocketConnectToPort** (*interp, s\_frame, w\_rcvr, w\_handle, w\_hostaddr, port*)

**primitiveSocketConnectionStatus** (*interp, s\_frame, w\_rcvr, w\_socket*)

**primitiveSocketCreate3Semaphores** (*interp, s\_frame, w\_rcvr, netType, socketType, rcvBufSize, sendBufSize, sema, readSema, writeSema*)

**primitiveSocketDestroy** (*interp, s\_frame, w\_rcvr, w\_handle*)

**primitiveSocketError** (*interp, s\_frame, argcount*)

**primitiveSocketGetOptions** (*interp, s\_frame, argcount*)

**primitiveSocketListenOnPortBacklogInterface** (*interp, s\_frame, argcount*)

**primitiveSocketListenWithBacklog** (*interp, s\_frame, argcount*)

**primitiveSocketListenWithOrWithoutBacklog** (*interp, s\_frame, argcount*)

**primitiveSocketLocalAddress** (*interp, s\_frame, argcount*)

**primitiveSocketLocalAddressResult** (*interp, s\_frame, argcount*)

**primitiveSocketLocalAddressSize** (*interp, s\_frame, argcount*)

**primitiveSocketLocalPort** (*interp, s\_frame, argcount*)

**primitiveSocketReceiveDataAvailable** (*interp, s\_frame, w\_rcvr, w\_handle*)

**primitiveSocketReceiveDataBufCount** (*interp, s\_frame, w\_rcvr, w\_handle, w\_target, start, count*)

**primitiveSocketReceiveUDPDataBufCount** (*interp, s\_frame, argcount*)

**primitiveSocketRemoteAddress** (*interp, s\_frame, argcount*)

**primitiveSocketRemoteAddressResult** (*interp, s\_frame, argcount*)

**primitiveSocketRemoteAddressSize** (*interp, s\_frame, argcount*)

**primitiveSocketRemotePort** (*interp, s\_frame, argcount*)

**primitiveSocketSendDataBufCount** (*interp, s\_frame, w\_rcvr, w\_handle, data, start, count*)

**primitiveSocketSendDone** (*interp, s\_frame, w\_rcvr, fd*)

**primitiveSocketSendUDPDataBufCount** (*interp, s\_frame, argcount*)

**primitiveSocketSetOptions** (*interp, s\_frame, argcount*)

### **rsqueakvm.plugins.squeak\_s\_s\_l module**

### **rsqueakvm.plugins.tailcall\_plugin module**

#### **class TailcallPlugin**

Bases: *rsqueakvm.plugins.plugin.Plugin*

**is\_optional** ()

**patch** ()

Called once in the beginning of *main.py* to patch interpreter.

**setup** ()

Called when enabled during instantiation.

**primitiveIsTailcallContext** (*interp, s\_frame, w\_rcv*)

**primitiveMarkTailcallContext** (*interp, s\_frame, w\_rcv*)

**rsqueakvm.plugins.unix\_o\_s\_process\_plugin** module

**rsqueakvm.plugins.v\_m\_debugging** module

**rsqueakvm.plugins.win32\_o\_s\_process\_plugin** module

### Module contents

**class PluginRegistry**

Bases: object

**static add** (*instance*)

**disabled\_names** = ['RubyPlugin']

**enabled\_names** = ['SimulationPlugin', 'FilePlugin', 'ImmutabilityPlugin', 'LargeInteger']

**enabled\_plugins** = [<rsqueakvm.plugins.simulation.SimulationPlugin object>, <rsqueakvm.plugins.file.FilePlugin object>]

**get\_plugins** ()

**print\_plugin\_overview** ()

**should\_load\_plugin** (*localfile*)

## 3.1.3 rsqueakvm.primitives package

### Submodules

**rsqueakvm.primitives.arithmetic** module

**rsqueakvm.primitives.array\_stream** module

**func** (*interp, s\_frame, w\_receiver, n0, w\_value*)

**rsqueakvm.primitives.block\_closure** module

**activateClosure** (*interp, w\_block, args\_w*)

**func** (*interp, s\_frame, w\_rcvr*)

**rsqueakvm.primitives.constants** module

**rsqueakvm.primitives.control** module

**rsqueakvm.primitives.input\_output** module

**func** (*interp, s\_frame, w\_rcvr*)

**rsqueakvm.primitives.mirror** module

**expose\_mirror\_primitive** (*code*)

**rsqueakvm.primitives.misc module**

```
fake_bytes_left (interp)  
func (interp, s_frame, w_receiver, attr_id)  
next_object (space, list_of_objects, w_obj)
```

**rsqueakvm.primitives.storage module**

```
func (interp, s_frame, w_class, bytecount, header)  
get_instances_array (interp, s_frame, w_class=None, store=True, some_instance=False)  
get_instances_array_gc (interp, w_class=None)  
get_instances_array_trace (interp, w_class, some_instance=False)  
next_instance (space, list_of_objects, w_obj)  
primitive_fetch (interp, s_frame, w_rcvr, n0)  
primitive_store (interp, s_frame, w_rcvr, n0, w_value)
```

**rsqueakvm.primitives.system module**

```
current_gc_old_mem (*args)  
current_gc_time (*args)  
current_gc_total_mem (*args)  
current_gc_young_mem (*args)  
func (interp, s_frame, w_rcvr, index)  
translated_or_default (default)
```

**Module contents**

```
class PrimitiveHolder  
    Bases: object  
assert_class (interp, w_obj, w_class)  
assert_pointers (w_obj)  
assert_valid_index (space, n0, w_obj)  
assert_valid_inst_index (space, n0, w_obj)  
expose_also_as (*codes)  
expose_alternative_primitive (code, **kwargs)  
expose_primitive (code, wrap_func=None, **kwargs)  
make_prim (i)  
make_simulation (code)  
primitive_name_from_code (code)  
unwrap_alternatives (unwrap_specs=None)
```

**wrap\_primitive** (*unwrap\_spec=None, no\_result=False, result\_is\_new\_frame=False, may\_context\_switch=True, clean\_stack=True, compiled\_method=False*)

### 3.1.4 rsqueakvm.util package

#### Submodules

##### rsqueakvm.util.bitmanipulation module

**class BitSplitter**

Bases: dict

##### rsqueakvm.util.cells module

**Cell** (*initial\_value, type=<type 'object'>*)

**QuasiConstant** (*initial\_value, cls=None*)

**class QuasiConstantCache**

Bases: rpython.rlib.cache.Cache

**class QuasiConstantMixin** (*initial\_value*)

Bases: object

Mixin for constant values that can be edited, but will be promoted to a constant when jitting.

**activate** ()

**changed** ()

**deactivate** ()

**get** ()

**is\_set** ()

**set** (*value*)

##### rsqueakvm.util.dialog module

**ask\_question** (*string*)

**get\_file** ()

##### rsqueakvm.util.logparser module

**class Trace** (*trace*)

Bases: object

**addbridge** (*trace*)

**keep\_op** (*op*)

**parse** (*remove\_debug, remove\_main\_labels, remove\_all\_labels*)

**parse\_bridges** ()

**parse\_loop** ()

**extract\_traces** (*file, remove\_debug=True, remove\_main\_labels=True, remove\_all\_labels=False*)

### rsqueakvm.util.platform\_calls module

**get\_memory\_usage** ()

### rsqueakvm.util.progress module

**class Progress** (*stages, silent=False*)

Bases: object

**next\_stage** (*steps*)

**update** (*new\_steps=-1*)

### rsqueakvm.util.shell module

**class Shell** (*interp, space, code=None*)

Bases: object

**db** (*code*)

!db to drop to pdb (untranslated) or gdb (translated)

**help** (*code*)

!help to print this help

**load** (*code*)

!load Filename to read and execute a file

**method** (*code*)

!method Class to define a method. End with !!

**q** (*code*)

!q for quitting

**raw\_input** (*delim*)

**reload** (*c*)

**reset\_readline** ()

**run** ()

**set\_interp** (*interp*)

**set\_readline** ()

**trace** (*code*)

!trace on/off to enable/disable interp tracing

**cmd** (*func*)

**completer** (*text, state, completions=None*)

**untranslated\_cmd** (*func*)



### rsqueakvm.util.stream module

**class Stream** (*filename=None, inputfile=None, data=None*)

Bases: object

Simple input stream. Data is completely read into memory. Constructor can raise OSError.

**be\_32bit** ()

**be\_64bit** ()

**bytes2dword\_with\_correct\_endianness** (*bytes*)

**bytes2qword\_with\_correct\_endianness** (*bytes*)

**close** ()

**length** ()

**next** ()

**next\_bytes** (*n*)

**next\_qword** ()

**next\_short** ()

**peek** ()

**peek\_bytes** (*n*)

**reset** ()

**reset\_count** ()

**skipbytes** (*jump*)

**skipwords** (*jump*)

**chrs2int** (*b*)

**chrs2long** (*b*)

**runpack** (*fmt, arg*)

**swapped\_chrs2int** (*b*)

**swapped\_chrs2long** (*b*)

### rsqueakvm.util.system module

**expose\_options** (*config*)

**translation\_options** ()

### rsqueakvm.util.version module

**class Version**

Bases: object

**class VersionMixin**

Bases: object

**changed** ()

```
version = <rsqueakvm.util.version.Version object>
elidable_for_version (numargs, promote='all')
elidable_for_version_iff (numargs, promote='all', cond=None)
```

## Module contents

## 3.2 Submodules

### 3.3 rsqueakvm.constants module

**decode\_alternate\_compiled\_method\_header** (*header*)

Decode 30-bit method header and apply new format.

(index 0) 16 bits: number of literals (#numLiterals) (index 16) 1 bit: has primitive (index 17) 1 bit: whether a large frame size is needed (#frameSize) (index 18) 6 bits: number of temporary variables (#numTemps) (index 24) 4 bits: number of arguments to the method (#numArgs) (index 28) 2 bits: reserved for an access modifier (00-unused, 01-private, 10-protected, 11-public)

**decode\_compiled\_method\_header** (*header*)

Decode 30-bit method header and apply new format.

(index 0) 9 bits: main part of primitive number (#primitive) (index 9) 8 bits: number of literals (#numLiterals) (index 17) 1 bit: whether a large frame size is needed (#frameSize) (index 18) 6 bits: number of temporary variables (#numTemps) (index 24) 4 bits: number of arguments to the method (#numArgs) (index 28) 1 bit: high-bit of primitive number (#primitive) (index 29) 1 bit: flag bit, ignored by the VM (#flag)

**find\_selectorindex** (*selector*)

**init\_special\_objects\_mapping** (*constant\_objects\_in\_special\_object\_table*)

### 3.4 rsqueakvm.display module

**class NullDisplay**

Bases: object

**defer\_updates** (*flag*)

**flip** (*pixels, x, y, x2, y2*)

**get\_dropped\_filename** ()

**get\_next\_event** (*time=0*)

**get\_pixelbuffer** ()

**get\_plain\_pixelbuffer** ()

**has\_clipboard\_text** ()

**has\_interrupts\_pending** ()

**is\_headless** ()

**mouse\_button** ()

**mouse\_point** ()

```

next_keycode ()
peek_keycode ()
render (force=False)
set_clipboard_text (text)
set_full_screen (flag)
set_interrupt_key (space, encoded_key)
set_title (title)
set_video_mode (w, h, d)
class SDLCursorClass
    Bases: object
    Cursor modification not yet implemented in RSDL2?
    cursor_words_to_bytes (bytenum, words)
        In Squeak, only the upper 16bits of the cursor form seem to count (I'm guessing because the code was
        ported over from 16-bit machines), so this ignores the lower 16-bits of each word.
    instance = None
    set (data_words, w, h, x, y, mask_words=None)
class SDLDisplay (title, highdpi, software_renderer, altf4quit)
    Bases: rsqueakvm.display.NullDisplay
    close ()
    copy_pixels (pixels, start, stop)
    create_window_and_renderer (x, y, width, height)
    defer_updates (flag)
    dequeue_event ()
    fix_key_code_case ()
    flip (pixels, x, y, x2, y2)
    full_damage ()
    get_clipboard_text ()
    get_dropevent (time, c_type, event)
    get_dropped_filename ()
    get_modifier_mask (shift)
    get_mouse_event_buttons_and_mods ()
    get_next_event (time=0)
    get_next_key_event (key_event_type, time)
    get_next_mouse_event (time)
    get_next_mouse_wheel_event (time, event)
    handle_keyboard_event (c_type, event)
    handle_mouse_button (c_type, event)

```

```
handle_mouse_move (c_type, event)
handle_textinput_event (event)
handle_windowevent (c_type, event)
has_clipboard_text ()
has_interrupts_pending ()
has_queued_events ()
insert_padding_event ()
is_control_key (key_ord)
is_headless ()
is_modifier_key (key_ord)
lock ()
mouse_button ()
mouse_point ()
next_keycode ()
peek_keycode ()
pump_events ()
queue_event (evt)
record_damage (x, y, w, h)
render (force=False)
reset_damage ()
set_clipboard_text (text)
set_full_screen (flag)
set_interrupt_key (space, encoded_key)
set_title (title)
set_video_mode (w, h, d)
unlock ()

exception SqueakInterrupt
  Bases: exceptions.Exception
```

## 3.5 rsqueakvm.error module

```
exception BlockCannotReturnError (msg='<no message>')
  Bases: rsqueakvm.error.SmalltalkException
  exception_type = 'BlockCannotReturnError'

exception CleanExit (msg='')
  Bases: rsqueakvm.error.Exit

exception CorruptImageError (msg)
  Bases: rsqueakvm.error.Exit
```

```

exception Exit (msg)
    Bases: exceptions.Exception

exception FatalError (msg='<no message>')
    Bases: rsqueakvm.error.SmalltalkException

    exception_type = 'FatalError'

exception MissingBytecode (bytecodename)
    Bases: rsqueakvm.error.SmalltalkException

    Bytecode not implemented yet.

    exception_type = 'MissingBytecode'

exception PrimitiveFailedError (msg="", name=None)
    Bases: rsqueakvm.error.SmalltalkException

    exception_type = 'PrimitiveFailedError'

exception PrimitiveNotYetWrittenError (msg="", name=None)
    Bases: rsqueakvm.error.PrimitiveFailedError

    exception_type = 'PrimitiveNotYetWrittenError'

exception SimulatedPrimitiveFailedError (msg, w_name, s_class)
    Bases: rsqueakvm.error.PrimitiveFailedError

    exception_type = 'SimulatedPrimitiveFailedError'

exception SmalltalkException (msg='<no message>')
    Bases: exceptions.Exception

    Base class for Smalltalk exception hierarchy

    exception_type = 'SmalltalkException'

exception UnwrappingError (msg="", name=None)
    Bases: rsqueakvm.error.PrimitiveFailedError

    exception_type = 'UnwrappingError'

exception WrapperException (msg="", name=None)
    Bases: rsqueakvm.error.PrimitiveFailedError

    exception_type = 'WrapperException'

exception WrappingError (msg="", name=None)
    Bases: rsqueakvm.error.PrimitiveFailedError

    exception_type = 'WrappingError'

```

### 3.6 rsqueakvm.interpreter module

```

exception ContextSwitchException (s_new_context)
    Bases: exceptions.Exception

    General Exception that causes the interpreter to leave the current context.

    print_trace()

    type = 'ContextSwitch'

```

**exception FreshReturn** (*exception*)

Bases: `exceptions.Exception`

**exception IntLocalReturn** (*intresult*)

Bases: `rsqueakvm.interpreter.LocalReturn`

**value** (*space*)

**exception IntNonLocalReturn** (*s\_home\_context*, *intvalue*)

Bases: `rsqueakvm.interpreter.NonLocalReturn`

**value** (*space*)

**class Interpreter** (*space*, *image=None*, *trace\_important=False*, *trace=False*, *evented=True*, *interrupts=True*)

Bases: `object`

**check\_for\_interrupts** (*s\_frame*)

**check\_sigusr** (*s\_frame*)

**create\_toplevel\_context** (*w\_receiver*, *selector=""*, *w\_selector=None*, *w\_arguments=[]*)

**event\_time\_now** ()

Answer the number of milliseconds since the millisecond clock was last reset or rolled over.

**getblockmethod** (*s\_context*)

**getreceiverclass** (*s\_context*)

**interpret\_toplevel** (*w\_frame*)

**is\_tracing** ()

**jit\_driver** = `<rpython.rlib.jit.JitDriver object>`

**jitted\_check\_for\_interrupt** (*s\_frame*)

**loop** (*w\_active\_context*)

**loop\_bytecodes** (*s\_context*, *may\_context\_switch*)

**perform** (*w\_receiver*, *selector=""*, *w\_selector=None*, *w\_arguments=[]*)

**perform\_headless** (*w\_receiver*, *w\_selector*, *w\_arguments*)

**print\_padded** (*str*)

**quick\_check\_for\_interrupt** (*s\_frame*, *dec=1*)

**resume\_driver** = `<rpython.rlib.jit.JitDriver object>`

**signal\_memory\_error** (*s\_frame*)

**stack\_frame** (*s\_frame*, *s\_sender*, *may\_context\_switch*)

**step** (*context*)

**time\_now** ()

Answer the UTC microseconds since the Smalltalk epoch. The value is derived from the Posix epoch with a constant offset corresponding to elapsed microseconds between the two epochs according to RFC 868

**unwind\_context\_chain** (*start\_context*, *target\_context*, *return\_value*, *s\_current\_context*)

**unwind\_context\_chain\_local** (*target\_context*, *return\_value*, *s\_current\_context*)

**unwind\_primitive\_simulation** (*start\_context*, *error\_code*)

**exception LocalReturn**Bases: *rsqueakvm.interpreter.Return***static make** (*space, w\_value*)**exception NonLocalReturn** (*s\_home\_context*)Bases: *rsqueakvm.interpreter.Return***static make** (*space, s\_home\_context, w\_value*)**exception NonVirtualReturn** (*s\_target\_context, s\_current\_context, w\_result*)Bases: *exceptions.Exception***print\_trace** ()**exception ProcessSwitch** (*s\_new\_context, forced=False*)Bases: *rsqueakvm.interpreter.ContextSwitchException*

This causes the interpreter to switch the executed context. Triggered when switching the process.

**type** = 'Process Switch'**exception Return**Bases: *exceptions.Exception***value** (*space*)**exception ReturnFromTopLevel** (*object, s\_current\_frame*)Bases: *exceptions.Exception***exception StackOverflow** (*s\_new\_context*)Bases: *rsqueakvm.interpreter.ContextSwitchException*

This causes the current jit-loop to be left, dumping all virtualized objects to the heap. This breaks performance, so it should rarely happen. In case of severe performance problems, execute with -t and check if this occurs.

**type** = 'Stack Overflow'**exception WrappedLocalReturn** (*w\_result*)Bases: *rsqueakvm.interpreter.LocalReturn***value** (*space*)**exception WrappedNonLocalReturn** (*s\_home\_context, w\_value*)Bases: *rsqueakvm.interpreter.NonLocalReturn***value** (*space*)**get\_printable\_location** (*pc, self, method, w\_class, blockmethod*)**resume\_get\_printable\_location** (*pc, self, method, w\_class*)

## 3.7 rsqueakvm.interpreter\_bytecodes module

**bytecode\_implementation** (*parameter\_bytes=0*)**initialize\_bytecode\_names** ()**initialize\_bytecode\_table** ()**initialize\_return\_bytecodes** ()**make\_call\_primitive\_bytecode** (*primitive, selector, argcount, store\_pc=False*)

```
make_call_primitive_bytecode_classbased(a_class_name, a_primitive, alternative_class_name, alternative_primitive, selector,  
                                         argcount)  
make_quick_call_primitive_bytecode(primitive_index, argcount)  
make_send_selector_bytecode(selector, argcount)  
class unrolling_int  
    Bases: int, rpython.rlib.unroll.SpecTag
```

## 3.8 rsqueakvm.interpreter\_debugging module

```
activate_debugging()  
activating_init(original)
```

## 3.9 rsqueakvm.key\_constants module

## 3.10 rsqueakvm.main module

```
class Config(space, argv)  
    Bases: object  
    ensure_path()  
    find_executable(executable)  
    get_exedir()  
    init_from_arguments()  
    init_from_ini()  
    parse_args(argv, skip_bad=False)  
    sanitize()  
active_context(space)  
compile_code(interp, w_receiver, code, isclass=False, make_selector=True)  
create_context(interp, w_receiver, selector, stringarg)  
create_process(interp, s_frame)  
entry_point(argv)  
execute_context(interp, s_frame)  
get_int_parameter(argv, idx, arg)  
get_parameter(argv, idx, arg)  
make_initial_space()  
print_error(str)  
result_string(w_result)  
safe_entry_point(argv)
```



## 3.11 rsqueakvm.objspace module

```

class ForceHeadless (space)
    Bases: object

class ObjSpace
    Bases: object

    display ()

    executable_path ()

    get_image_name ()

    get_special_selector (selector)

    get_system_attribute (idx)

    init_system_attributes (argv)

    make_special_objects ()

    newClosure (w_outer_ctxt, pc, numArgs, copiedValues)

    runtime_setup (interp, exepath, argv, image_name, image_args_idx)

    set_system_attribute (idx, value)

    set_w_display (w_obj)

    set_w_interrupt_semaphore (w_obj)

    set_w_jit_hook_receiver (w_obj)

    set_w_jit_hook_selector (w_obj)

    set_w_low_space_semaphore (w_obj)

    set_w_timerSemaphore (w_obj)

    smalltalk_at (string)
        A helper to find a class by name in modern Squeak images

    unwrap_array (w_array)

    unwrap_char_as_byte (w_char)

    unwrap_float (w_v)

    unwrap_int (w_value)

    unwrap_int64 (w_value)

    unwrap_positive_uint (w_value)

    unwrap_rbigint (w_value)

    unwrap_string (w_object)

    unwrap_uint (w_value)

    w_display ()

    w_interrupt_semaphore ()

    w_jit_hook_receiver ()

    w_jit_hook_selector ()

```

```
w_low_space_semaphore ()
w_timerSemaphore ()
window_title ()
wrap_bool (b)
wrap_char (c)
wrap_float (i)
wrap_int (val)
wrap_list (lst_w)
    Converts a Python list of wrapped objects into a wrapped smalltalk array
wrap_list_unroll_safe (lst_w)
wrap_rbigint (val)
wrap_rbigint_direct (val, w_class=None)
wrap_smallint_unsafe (val)
wrap_string (string)
wrap_symbol (string)
wrap_wordint_direct (val, w_class)
add_special_properties ()
empty_object ()
empty_symbol ()
```

## 3.12 rsqueakvm.squeakimage module

```
class AncientReader (imageReader, version, stream, space)
    Bases: rsqueakvm.squeakimage.NonSpurReader
    Reader strategy for pre-4.0 images

class BaseReaderStrategy (imageReader, version, stream, space)
    Bases: object

    assign_prebuilt_constants ()
    continue_read_header ()
    fillin_finalize ()
    fillin_w_object (chunk)
    fillin_w_objects ()
    fillin_weak_w_object (chunk)
    fillin_weak_w_objects ()
    g_class_of (chunk)
    get_bytes_of (chunk)
    init_compactclassesarray ()
```

```

init_g_object (chunk)
init_g_objects ()
init_w_object (chunk)
init_w_objects ()
isbiginteger (g_object)
isfloat (g_object)
islargeinteger (g_object)
issignedinteger (g_object)
isunsignedinteger (g_object)
len_bytes_of (chunk)
log (msg)
lookup_in_assocs_g (array_g, lookup_name)
read_and_initialize ()
read_body ()
skip_to_body ()
smalltalk_g_at (lookup_name)
special_g_object (index)
special_g_object_safe (index)

```

#### class GenericObject

Bases: object

Intermediate representation of squeak objects. To establish all pointers as object references, ImageReader creates instances of GenericObject from the image chunks, and uses them as starting point for the actual create of rsqueakvm.model classes.

```

as_string ()
classname ()
fillin (space)
fillin_finalize (space)
fillin_weak (space)
format
get_bytes ()
get_class ()
get_hash ()
get_pointers ()
get_ruints (required_len=-1)
hash
init_g_class ()
init_pointers ()

```

```
init_w_object (space)
initialize (chunk, reader, space)
initialize_char (untagged_value, reader, space)
initialize_int (value, reader, space)
isinitialized()
isweak()
len_bytes()
size

class ImageChunk (size, format, classid, hash, data=None)
  Bases: object

  A chunk knows the information from the header, but the body of the object is not decoded yet.

  as_g_object (reader, space)
  iscompact()

class ImageReader (space, stream, logging_enabled=False)
  Bases: object

  choose_reader_strategy()
  chunklist
  chunks
  compactclasses
  create_image()
  decode_pointers (g_object, space, end=-1)
  g_class_of (chunk)
  intcache
  read_all()
  read_header()
  read_version()
  try_read_version()

class ImageVersion (magic, is_big_endian, is_64bit, has_closures, has_floats_reversed, is_spur=False)
  Bases: object

  configure_stream (stream)

class NonSpurReader (imageReader, version, stream, space)
  Bases: rsqueakvm.squeakimage.BaseReaderStrategy

  decode_pointers (g_object, space, end=-1)
  g_class_of (chunk)
  init_compactclassesarray()
    from the blue book (CompiledMethod Symbol Array PseudoContext LargePositiveInteger nil MethodDic-
    tionary Association Point Rectangle nil TranslatedMethod BlockContext MethodContext nil nil nil nil
    nil nil nil nil nil nil nil nil nil nil nil nil)
```

```

init_g_objects ()
instantiate (g_object)
    0 no fields
        1 fixed fields only (all containing pointers) 2 indexable fields only (all containing pointers)
        3 both fixed and indexable fields (all containing pointers) 4 both fixed and indexable weak
        fields (all containing pointers).
        5 unused 6 indexable word fields only (no pointers) 7 indexable long (64-bit) fields (only in
        64-bit images)
        8-11 indexable byte fields only (no pointers) (low 2 bits are low 2 bits of size)
    12-15 compiled methods: # of literal oops specified in method header, followed by indexable bytes (same
    interpretation of low 2 bits as above)
isblockclosure (g_object)
isbytes (g_object)
ischar (g_object)
iscompiledmethod (g_object)
ispointers (g_object)
isweak (g_object)
iswords (g_object)
literal_count_of_method_header (untagged_header)
read_1wordobjectheader ()
read_2wordobjectheader ()
read_3wordobjectheader ()
read_body ()
read_object ()
class SpurImageWriter (interp, filename)
    Bases: object
    convert_instspec_to_spur (spec)
    fixed_and_indexable_size_for (obj)
    frame_size_for (obj)
    headers_for_hash_numfields (Class, Hash, size)
    image_header_size = 64
    insert_class_into_classtable (obj)
    len_and_header (obj)
    old_to_spur_specs = [0, 1, 2, 3, 4, -1, 10, 9, 16, 16, 16, 16, 24, 24, 24, 24]
    padding_for (length)
    reserve (obj)
    ruint64_tobytes (i)
    trace_image (s_frame)

```

```
trace_until_finish()
word_size = 4
write_and_trace(obj)
write_bytes_object(obj)
write_compiled_method(obj)
write_file_header(w_special_objects)
write_header(hdrsize, sz, obj, oop)
write_last_bridge()
write_pointers_object(obj)
write_word(word)
write_words_object(obj)

class SpurReader(imageReader, version, stream, space)
  Bases: rsqueakvm.squeakimage.BaseReaderStrategy

  FREE_OBJECT_CLASS_INDEX_PUN = 0
  SLOTS_MASK = -72057594037927936

  continue_read_header()

  decode_pointers(g_object, space, end=-1)

  g_class_of(chunk)

  instantiate(g_object)
    0 no fields 1 fixed fields only (all containing pointers) 2 indexable fields only (all containing pointers) 3
    both fixed and indexable fields (all containing pointers) 4 indexable weak fields (all containing pointers) 5
    fixed weak fields (all containing pointers) 6-8 unused

    9 indexable 64 bit fields (no pointers) 10-11 indexable 32 bit fields (no pointers) 12-15 indexable 16 bit
    fields (no pointers) 16-23 indexable byte fields (no pointers)

    for the above, the lower bits are the lower bits of the size

    24-31 compiled methods: # of literal oops specified in method header, followed by indexable bytes (same
    interpretation of low bits as above)

  isblockclosure(g_object)
  isbytes(g_object)
  ischar(g_object)
  iscompiledmethod(g_object)
  ispointers(g_object)
  isweak(g_object)
  iswords(g_object)

  literal_count_of_method_header(untagged_header)
  major_class_index_of(classid)
  minor_class_index_of(classid)
```

```

    read_body ()
    read_object ()
    words_for (size)
class SqueakImage (reader)
    Bases: object
    find_symbol (space, reader, symbol)
    special (index)

```

### 3.13 rsqueakvm.storage module

```

class AbstractCachingShadow (space, w_self, size, w_class)
    Bases: rsqueakvm.storage.AbstractGenericShadow

    Abstract shadow maintaining an empty version object for the underlying Smalltalk object. The version object
    allows jit-related optimizations.

    changed ()
    get_storage (w_self)
    repr_classname = 'AbstractCachingShadow'
    set_storage (w_self, storage)
    version = None

class AbstractGenericShadow (space, w_self, size, w_class)
    Bases: rsqueakvm.storage.ListStrategy

    This class behaves just like a generic list storage strategy, but allows safe subclassing for more specific, non-
    singleton strategies.

    become (w_other)
    get_storage (w_self)
    is_shadow ()
    onesided_become (w_other)
    own_fetch (i)
    own_size ()
    own_store (i, val)
    promote_if_neccessary ()
    set_storage (w_self, storage)
    w_self ()

class AbstractStrategy (space, w_self, size, w_class)
    Bases: object

    Subclasses of this handle the information contained in Smalltalk objects. The common API allows to store
    and fetch elements from object slots. Every object has some kind of storage representation attached. Some
    subclasses (those with *Shadow in their name) contain additional information, required by the VM. These
    'shadows' not only manage the memory of their Smalltalk objects, but are also the VM-internal representation
    of these objects.

```

```
append (w_self, list_w)
become (w_other)
delete (w_self, start, end)
fetch (w_self, index0)
fetch_all (w_self)
get_storage (w_self)
getclass ()
getname ()
handles_become ()
    Only shadows are non-singletons and actually handle become
insert (w_self, index0, list_w)
instantiate (w_self, w_class)
is_shadow ()
onesided_become (w_other)
pop (w_self, index0)
promote_if_neccessary ()
provides_getname = False
repr_classname = 'AbstractStrategy'
set_storage (w_self, storage)
size (w_self)
slice (w_self, start, end)
store (w_self, index0, value)
store_all (w_self, elements)
strategy_factory ()
strategy_switched (w_self)
class AllNilStrategy (space, w_self, size, w_class)
    Bases: rsqueakvm.storage.SimpleStorageStrategy
    append (w_self, list_w)
    delete (w_self, start, end)
    fetch (w_self, index0)
    fetch_all (w_self)
    generalized_strategy_for (value)
    get_storage (w_self)
    insert (w_self, index0, list_w)
    instantiate_type
        alias of AllNilStrategy
    pop (w_self, index0)
```



```

repr_classname = 'AllNilStrategy'
set_storage (w_self, storage)
size (w_self)
slice (w_self, start, end)
store (w_self, index0, value)
store_all (w_self, elements)
strategy_switched (w_self)
value ()

```

**class CachedObjectShadow** (*space, w\_self, size, w\_class*)  
 Bases: *rsqueakvm.storage.AbstractCachingShadow*

A shadow which treats its contents as jit constants as long as the object is not modified.

```

fetch (arg0, arg1)
get_storage (w_self)
instantiate_type
    alias of CachedObjectShadow
repr_classname = 'CachedObjectShadow'
set_storage (w_self, storage)
store (w_self, n0, w_value)

```

**class CharacterOrNilStrategy** (*space, w\_self, size, w\_class*)  
 Bases: *rsqueakvm.storage.SimpleStorageStrategy*

```

append (w_self, list_w)
contained_type
    alias of rsqueakvm.model.character.W_Character
delete (w_self, start, end)
fetch (w_self, index0)
fetch_all (w_self)
generalized_strategy_for (value)
get_storage (w_self)
insert (w_self, start, list_w)
instantiate_type
    alias of CharacterOrNilStrategy
pop (w_self, index0)
repr_classname = 'CharacterOrNilStrategy'
set_storage (w_self, storage)
size (w_self)
slice (w_self, start, end)
store (w_self, index0, wrapped_value)
store_all (w_self, elements)

```

```
strategy_switched (w_self)
unwrap (w_val)
unwrapped_tagged_value ()
wrap (val)
wrapped_tagged_value ()

class ExtendableStrategyMetaclass
  Bases: rpython.tool.pairtype.extendabletype, rpython.rlib.rstrategies.
    rstrategies.StrategyMetaclass

class FloatOrNilStrategy (space, w_self, size, w_class)
  Bases: rsqueakvm.storage.SimpleStorageStrategy

  append (w_self, list_w)

  contained_type
    alias of rsqueakvm.model.numeric.W_Float

  delete (w_self, start, end)

  fetch (w_self, index0)

  fetch_all (w_self)

  generalized_strategy_for (value)

  get_storage (w_self)

  insert (w_self, start, list_w)

  instantiate_type
    alias of FloatOrNilStrategy

  pop (w_self, index0)

  repr_classname = 'FloatOrNilStrategy'

  set_storage (w_self, storage)

  size (w_self)

  slice (w_self, start, end)

  store (w_self, index0, wrapped_value)

  store_all (w_self, elements)

  strategy_switched (w_self)

  tag_float = 1.7976931348623157e+308

  unwrap (w_val)

  unwrapped_tagged_value ()

  wrap (val)

  wrapped_tagged_value ()

class ListEntry
  Bases: object

  static build (value, is_instvar)

  static is_strong_anyway (value, is_instvar)
```

```

class ListStrategy (space, w_self, size, w_class)
  Bases: rsqueakvm.storage.SimpleStorageStrategy

  append (w_self, list_w)
  delete (w_self, start, end)
  fetch (w_self, index0)
  fetch_all (w_self)
  get_storage (w_self)
  insert (w_self, start, list_w)
  instantiate_type
    alias of ListStrategy
  pop (w_self, index0)
  repr_classname = 'ListStrategy'
  set_storage (w_self, storage)
  size (w_self)
  slice (w_self, start, end)
  store (w_self, index0, w_value)
  store_all (w_self, elements)
  strategy_switched (w_self)

```

```

class ObserverShadow (space, w_self, size, w_class)
  Bases: rsqueakvm.storage.AbstractGenericShadow

  A generic shadow that notifies a single observer object whenever changes are made.

  get_storage (w_self)
  instantiate_type
    alias of ObserverShadow
  repr_classname = 'ObserverShadow'
  set_observer (observer)
  set_storage (w_self, storage)
  store (w_self, n0, w_value)

```

```

class OptimizedConvertFromAllNilMixin
  Bases: object

```

```

class ShadowMixin
  Bases: object

```

Shadows are non-singleton strategies. They maintain a backpointer to their shadowed W\_PointersObject instance. This is a mixin, because it is used at several places in the class tree.

```

become (w_other)
is_shadow ()
onesided_become (w_other)
own_fetch (i)

```

```
own_size ()
own_store (i, val)
promote_if_neccessary ()
w_self ()
```

**class SimpleStorageStrategy** (*space, w\_self, size, w\_class*)  
Bases: *rsqueakvm.storage.AbstractStrategy*

Singleton strategies handle ‘simple’ object storage in normal objects, without additional VM-internal information. Depending on the data inside an object, different optimizing strategies are used.

```
check_index_fetch (w_self, index0)
check_index_range (w_self, start, end)
check_index_store (w_self, index0)
default_value ()
get_storage (w_self)
repr_classname = 'SimpleStorageStrategy'
set_storage (w_self, storage)
```

**class SmallIntegerOrNilStrategy** (*space, w\_self, size, w\_class*)  
Bases: *rsqueakvm.storage.SimpleStorageStrategy*

```
append (w_self, list_w)
contained_type
    alias of rsqueakvm.model.numeric.W_SmallInteger
delete (w_self, start, end)
fetch (w_self, index0)
fetch_all (w_self)
generalized_strategy_for (value)
get_storage (w_self)
insert (w_self, start, list_w)
instantiate_type
    alias of SmallIntegerOrNilStrategy
pop (w_self, index0)
repr_classname = 'SmallIntegerOrNilStrategy'
set_storage (w_self, storage)
size (w_self)
slice (w_self, start, end)
store (w_self, index0, wrapped_value)
store_all (w_self, elements)
strategy_switched (w_self)
unwrap (w_val)
unwrapped_tagged_value ()
```

```

wrap (val)

wrapped_tagged_value ()

class StrategyFactory (space)
    Bases: rpython.rlib.rstrategies.rstrategies.StrategyFactory

    empty_storage_type (w_self, size, weak=False)

    instantiate_strategy (strategy_type, w_class, w_self=None, initial_size=0)
        Return a functional instance of strategy_type. Overwrite this if you need a non-default constructor. The
        two additional parameters should be ignored for singleton-strategies.

    log (w_self, new_strategy, old_strategy=None, new_element=None)
        This can be overwritten into a more appropriate call to self.logger.log

    set_initial_strategy (w_self, strategy_type, w_class, size, elements=None)
        Initialize the strategy and storage fields of w_self. This must be called before switch_strategy or any
        strategy method can be used. elements is an optional list of values initially stored in w_self. If given, then
        len(elements) == size must hold.

    strategy_singleton_instance (strategy_class, w_class=None)

    strategy_singleton_instance_from_cache (strategy_class, w_class)

    strategy_type_for (objects, weak=False)
        Return the best-fitting strategy to hold all given objects.

    switch_strategy (w_self, new_strategy_type, new_element=None)
        Switch the strategy of w_self to the new type. new_element can be given as a hint, purely for logging
        purposes. It should be the object that was added to w_self, causing the strategy switch.

class StrongListEntry (value)
    Bases: rsqueakvm.storage.ListEntry

    get ()

class WeakListEntry (value)
    Bases: rsqueakvm.storage.ListEntry

    get ()

class WeakListStrategy (space, w_self, size, w_class)
    Bases: rsqueakvm.storage.SimpleStorageStrategy

    append (w_self, list_w)

    delete (w_self, start, end)

    fetch (w_self, index0)

    fetch_all (w_self)

    get_storage (w_self)

    insert (w_self, start, list_w)

    instantiate_type
        alias of WeakListStrategy

    pop (w_self, index0)

    repr_classname = 'WeakListStrategy'

    set_storage (w_self, storage)

    size (w_self)

```

```
slice (w_self, start, end)
store (w_self, index0, wrapped_value)
store_all (w_self, elements)
strategy_switched (w_self)
```

## 3.14 rsqueakvm.storage\_classes module

```
class ClassShadow (space, w_self, size, w_class)
    Bases: rsqueakvm.storage.AbstractCachingShadow
```

A shadow for Smalltalk objects that are classes (i.e. used as the class of another Smalltalk object).

```
attach_s_class (s_other)
changed ()
detach_s_class (s_other)
flush_method_caches ()
get_instance_kind ()
get_storage (w_self)
getname ()
inherits_from (s_superclass)
initialize_methoddict ()
installmethod (w_selector, w_method)
instantiate_type
    alias of ClassShadow
instsize ()
isvariable ()
lookup (arg0)
make_pointers_object (w_cls, size)
name = '??? (incomplete class info)'
new (extrasize=0)
provides_getname = True
repr_classname = 'ClassShadow'
s_methoddict ()
s_superclass ()
set_storage (w_self, storage)
store (w_self, n0, w_val)
store_pre_spur_classformat (w_self, n0, w_val)
store_s_methoddict (s_methoddict)
store_spur_classformat (w_self, n0, w_val)
```

```

    store_w_methoddict (w_methoddict)

    store_w_name (w_name)

    store_w_superclass (w_class)

    superclass_changed (version)

    w_methoddict ()

exception ClassShadowError (msg='<no message>')
    Bases: rsqueakvm.error.SmalltalkException

    exception_type = 'ClassShadowError'

class MethodDictionaryShadow (space, w_self, size, w_class)
    Bases: rsqueakvm.storage.AbstractGenericShadow

    become (w_other)

    find_selector (w_selector)

    flush_method_cache ()

    get_storage (w_self)

    instantiate_type
        alias of MethodDictionaryShadow

    notify ()

    repr_classname = 'MethodDictionaryShadow'

    set_storage (w_self, storage)

    setup_notification ()

    store (w_self, n0, w_value)

    sync_method_cache ()

    w_values ()

```

### 3.15 rsqueakvm.storage\_contexts module

```

class ContextPartShadow (space, w_self, size, w_class)
    Bases: rsqueakvm.storage.AbstractStrategy

```

This Shadow handles the entire object storage on its own, ignoring the `_storage` field in `W_PointersObject`. The `w_self` parameter in `fetch/store/size` etc. is ignored, and the `own_fetch/own_store/own_size` methods from `ShadowMixin` should be used instead. This shadow can exist without a `W_PointersObject`. In order to integrate well with the RPython toolchain (virtualizables and jit), this class actually represents one of two classes, determined by the `is_block_context` switch.

```

    argument_strings ()

    become (w_other)

    static build_block_context (space, s_home, argcnt, pc)

    static build_method_context (space, w_method, w_receiver, arguments=[], closure=None,
                                s_fallback=None)

    bytecodePrimAdd (interp, current_bytecode)

```

`bytecodePrimAt` (*interp*, *current\_bytecode*)  
`bytecodePrimAtEnd` (*interp*, *current\_bytecode*)  
`bytecodePrimAtPut` (*interp*, *current\_bytecode*)  
`bytecodePrimBitAnd` (*interp*, *current\_bytecode*)  
`bytecodePrimBitOr` (*interp*, *current\_bytecode*)  
`bytecodePrimBitShift` (*interp*, *current\_bytecode*)  
`bytecodePrimBlockCopy` (*interp*, *current\_bytecode*)  
`bytecodePrimClass` (*interp*, *current\_bytecode*)  
`bytecodePrimDiv` (*interp*, *current\_bytecode*)  
`bytecodePrimDivide` (*interp*, *current\_bytecode*)  
`bytecodePrimDo` (*interp*, *current\_bytecode*)  
`bytecodePrimEqual` (*interp*, *current\_bytecode*)  
`bytecodePrimEquivalent` (*interp*, *current\_bytecode*)  
`bytecodePrimGreaterOrEqual` (*interp*, *current\_bytecode*)  
`bytecodePrimGreaterThan` (*interp*, *current\_bytecode*)  
`bytecodePrimLessOrEqual` (*interp*, *current\_bytecode*)  
`bytecodePrimLessThan` (*interp*, *current\_bytecode*)  
`bytecodePrimMakePoint` (*interp*, *current\_bytecode*)  
`bytecodePrimMod` (*interp*, *current\_bytecode*)  
`bytecodePrimMultiply` (*interp*, *current\_bytecode*)  
`bytecodePrimNew` (*interp*, *current\_bytecode*)  
`bytecodePrimNewWithArg` (*interp*, *current\_bytecode*)  
`bytecodePrimNext` (*interp*, *current\_bytecode*)  
`bytecodePrimNextPut` (*interp*, *current\_bytecode*)  
`bytecodePrimNotEqual` (*interp*, *current\_bytecode*)  
`bytecodePrimPointX` (*interp*, *current\_bytecode*)  
`bytecodePrimPointY` (*interp*, *current\_bytecode*)  
`bytecodePrimSize` (*interp*, *current\_bytecode*)  
`bytecodePrimSubtract` (*interp*, *current\_bytecode*)  
`bytecodePrimValue` (*interp*, *current\_bytecode*)  
`bytecodePrimValueWithArg` (*interp*, *current\_bytecode*)  
`callPrimitiveBytecode` (*interp*, *current\_bytecode*)  
`debug_bytecode` (*interp*)  
`doubleExtendedDoAnythingBytecode` (*interp*, *current\_bytecode*)  
`duplicateTopBytecode` (*interp*, *current\_bytecode*)  
`enter_virtual_frame` (*s\_sender*)



```

exitFromHeadlessExecution (selector="", w_message=None)
expected_argument_count ()
extendedPushBytecode (interp, current_bytecode)
extendedStoreAndPopBytecode (interp, current_bytecode)
extendedStoreBytecode (interp, current_bytecode)
external_stackpointer ()
fetch (ignored_w_self, n0)
fetch_block_context (n0)
fetch_bytecode (pc)
fetch_context_part (n0)
fetch_method_context (n0)
fetch_next_bytecode ()
full_stacksize ()
get_extra_data ()
get_fallback ()
get_state ()
get_storage (w_self)
gettemp (index)
gettemp_block_context (index)
gettemp_method_context (index0)
has_s_sender ()
home_is_self ()
home_is_self_block_context ()
home_is_self_method_context ()
init_temps_and_stack ()
initialip ()
initialize_temps (space, arguments)
instances_array (w_class)
instantiate_type
    alias of ContextPartShadow
is_BlockClosure_ensure ()
is_closure_context ()
is_closure_context_block_context ()
is_closure_context_method_context ()
is_privileged_index (n0)
is_returned ()

```

```
is_shadow()
leave_virtual_frame(vref, ref)
longJumpIfFalseBytecode(interp, current_bytecode)
longJumpIfTrueBytecode(interp, current_bytecode)
longUnconditionalJumpBytecode(interp, current_bytecode)
mark_returned()
method_str()
method_str_block_context()
method_str_method_context()
onesided_become(w_other)
own_fetch(i)
own_size()
own_store(i, val)
pc()
peek(idx)
peek_n(n)
pop()
popStackBytecode(interp, current_bytecode)
pop_and_return_n(n)
pop_n(n)
print_padded_stack(method)
print_stack(method=True)
privileged_block_fields = (5,)
privileged_method_fields = (3, 4)
promote_if_neccessary()
pure_is_block_context()
push(w_v)
pushActiveContextBytecode(interp, current_bytecode)
pushClosureCopyCopiedValuesBytecode(interp, current_bytecode)
pushConstantFalseBytecode(interp, current_bytecode)
pushConstantMinusOneBytecode(interp, current_bytecode)
pushConstantNilBytecode(interp, current_bytecode)
pushConstantOneBytecode(interp, current_bytecode)
pushConstantTrueBytecode(interp, current_bytecode)
pushConstantTwoBytecode(interp, current_bytecode)
pushConstantZeroBytecode(interp, current_bytecode)
```

```
pushLiteralConstantBytecode (interp, current_bytecode)
pushLiteralVariableBytecode (interp, current_bytecode)
pushNewArrayBytecode (interp, current_bytecode)
pushReceiverBytecode (interp, current_bytecode)
pushReceiverVariableBytecode (interp, current_bytecode)
pushRemoteTempLongBytecode (interp, current_bytecode)
pushTemporaryVariableBytecode (interp, current_bytecode)
push_all (lst)
remove_s_sender ()
repr_classname = 'ContextPartShadow'
reset_pc ()
reset_stack ()
returnFalseBytecode (interp, current_bytecode)
returnNilBytecode (interp, current_bytecode)
returnReceiverBytecode (interp, current_bytecode)
returnTopFromBlockBytecode (interp, current_bytecode)
returnTopFromMethodBytecode (interp, current_bytecode)
returnTrueBytecode (interp, current_bytecode)
s_home ()
s_home_block_context ()
s_home_method_context ()
s_sender ()
secondExtendedSendBytecode (interp, current_bytecode)
sendLiteralSelectorBytecode (interp, current_bytecode)
set_state (t)
set_storage (w_self, storage)
set_top (value, position=0)
settemp (index, w_value)
settemp_block_context (index, w_value)
settemp_method_context (index0, w_value)
shortConditionalJumpBytecode (interp, current_bytecode)
shortUnconditionalJumpBytecode (interp, current_bytecode)
short_str ()
singleExtendedSendBytecode (interp, current_bytecode)
singleExtendedSuperBytecode (interp, current_bytecode)
size (ignored_w_self)
```

```
stack ()
stack_get (index0)
stack_ptr ()
stack_put (index0, w_val)
stackdepth ()
stackend ()
stacksize ()
stackstart ()
stackstart_block_context ()
stackstart_method_context ()
store (ignored_w_self, n0, w_value)
storeAndPopReceiverVariableBytecode (interp, current_bytecode)
storeAndPopRemoteTempLongBytecode (interp, current_bytecode)
storeAndPopTemporaryVariableBytecode (interp, current_bytecode)
storeRemoteTempLongBytecode (interp, current_bytecode)
store_block_context (n0, w_value)
store_context_part (n0, w_value)
store_expected_argument_count (argc)
store_initialip (initialip)
store_instances_array (w_class, match_w)
store_method_context (n0, w_value)
store_pc (newpc)
store_s_sender (s_sender)
store_stack_ptr (ptr)
store_stackpointer (size)
store_unwrap_pc (w_pc)
store_w_home (w_home)
store_w_method (w_method)
store_w_receiver (w_receiver)
tempsize ()
tempsize_block_context ()
tempsize_method_context ()
top ()
unknownBytecode (interp, current_bytecode)
unwrap_store_eargc (w_value)
unwrap_store_initialip (w_value)
```

```

unwrap_store_stackpointer(w_sp1)
w_arguments()
w_arguments_block_context()
w_arguments_method_context()
w_method()
w_method_block_context()
w_method_method_context()
w_receiver()
w_receiver_block_context()
w_receiver_method_context()
w_self()
w_sender()
wrap_eargc()
wrap_initialip()
wrap_pc()
wrap_stackpointer()
class ContextState(name)
    Bases: object
    num()
    states = [InactiveContext, ActiveContext, DirtyContext]
class ExtraContextAttributes
    Bases: object
fresh_virtualizable(x)

```

### 3.16 rsqueakvm.wrapper module

```

class AssociationWrapper(space, w_self)
    Bases: rsqueakvm.wrapper.Wrapper
    static build(space, w_assoc)
    key()
    static make_w_assoc(space, w_key, w_value)
    store_value(w_new)
    value()
class CriticalSectionWrapper(space, w_self)
    Bases: rsqueakvm.wrapper.LinkedListWrapper
    enter(s_frame)
    exit(s_current_frame)
    owner()

```

```
    store_owner (w_new)

    test_and_set_owner (s_current_frame)

class FormWrapper (space, w_self)
    Bases: rsqueakvm.wrapper.Wrapper

    bits ()

    create_display_bitmap ()

    depth ()

    get_display_bitmap ()

    height ()

    store_bits (w_new)

    store_depth (new)

    store_height (new)

    store_width (new)

    take_over_display ()

    width ()

class LinkWrapper (space, w_self)
    Bases: rsqueakvm.wrapper.Wrapper

    next_link ()

    store_next_link (w_new)

class LinkedListWrapper (space, w_self)
    Bases: rsqueakvm.wrapper.Wrapper

    add_last_link (w_process)

    first_link ()

    is_empty_list ()

    last_link ()

    remove (w_link)

    remove_first_link_of_list ()

    store_first_link (w_new)

    store_last_link (w_new)

class PointWrapper (space, w_self)
    Bases: rsqueakvm.wrapper.Wrapper

    store_x (new)

    store_y (new)

    x ()

    y ()

class ProcessWrapper (space, w_self)
    Bases: rsqueakvm.wrapper.LinkWrapper

    is_active_process ()
```

```

    my_list ()
    priority ()
    put_to_sleep ()
    resume (s_current_frame, forced=False)
    store_my_list (w_new)
    store_suspended_context (w_new)
    suspend (s_current_frame)
    suspended_context ()
    transfer_to_self_from (s_old_frame, forced=False)
    yield_ (s_current_frame)

class PromotingAssociationWrapper (space, w_self)
    Bases: rsqueakvm.wrapper.AssociationWrapper
    value ()

class SchedulerWrapper (space, w_self)
    Bases: rsqueakvm.wrapper.Wrapper
    active_process ()
    get_process_list (priority)
    priority_list ()
    process_list (priority)
    store_active_process (w_new)
    wake_highest_priority_process ()

class SemaphoreWrapper (space, w_self)
    Bases: rsqueakvm.wrapper.LinkedListWrapper
    excess_signals ()
    signal (s_current_frame, forced=False)
    store_excess_signals (new)
    wait (s_current_frame)

class VarsizedWrapper (space, w_self)
    Bases: rsqueakvm.wrapper.Wrapper
    at0 (i0)
    atput0 (i0, w_value)

class Wrapper (space, w_self)
    Bases: object
    read (index0)
    write (index0, w_new)

make_getter (index0)
make_getter_setter (index0)
make_int_getter (index0)

```

**make\_int\_getter\_setter** (*index0*)

**make\_int\_setter** (*index0*)

**make\_setter** (*index0*)

**scheduler** (*space*)

**unwrapped\_wake\_highest\_priority\_process** (*space, w\_lists*)

## 3.17 Module contents



## CHAPTER 4

---

### Indices and tables

---

- `genindex`
- `modindex`
- `search`



### r

- `rsqueakvm`, 68
- `rsqueakvm.constants`, 38
- `rsqueakvm.display`, 38
- `rsqueakvm.error`, 40
- `rsqueakvm.interpreter`, 41
- `rsqueakvm.interpreter_bytecodes`, 43
- `rsqueakvm.interpreter_debugging`, 44
- `rsqueakvm.key_constants`, 44
- `rsqueakvm.main`, 44
- `rsqueakvm.model`, 21
- `rsqueakvm.model.base`, 5
- `rsqueakvm.model.block_closure`, 8
- `rsqueakvm.model.character`, 9
- `rsqueakvm.model.compiled_methods`, 10
- `rsqueakvm.model.display`, 13
- `rsqueakvm.model.numeric`, 14
- `rsqueakvm.model.pointers`, 18
- `rsqueakvm.model.variable`, 19
- `rsqueakvm.objspace`, 45
- `rsqueakvm.plugins`, 33
- `rsqueakvm.plugins.database`, 23
- `rsqueakvm.plugins.database.model`, 22
- `rsqueakvm.plugins.file_plugin`, 27
- `rsqueakvm.plugins.immutability`, 25
- `rsqueakvm.plugins.immutability.bytes`, 24
- `rsqueakvm.plugins.immutability.pointers`, 24
- `rsqueakvm.plugins.immutability.words`, 25
- `rsqueakvm.plugins.immutability_plugin`, 27
- `rsqueakvm.plugins.large_integers`, 28
- `rsqueakvm.plugins.locale_plugin`, 28
- `rsqueakvm.plugins.misc_primitive_plugin`, 29
- `rsqueakvm.plugins.plugin`, 29
- `rsqueakvm.plugins.profiler_plugin`, 29
- `rsqueakvm.plugins.ruby_plugin`, 30
- `rsqueakvm.plugins.simulation`, 30
- `rsqueakvm.plugins.socket_plugin`, 30
- `rsqueakvm.plugins.tailcall_plugin`, 32
- `rsqueakvm.plugins.vmdebugging`, 26
- `rsqueakvm.plugins.vmdebugging.hooks`, 26
- `rsqueakvm.plugins.vmdebugging.model`, 26
- `rsqueakvm.primitives`, 34
- `rsqueakvm.primitives.array_stream`, 33
- `rsqueakvm.primitives.block_closure`, 33
- `rsqueakvm.primitives.constants`, 33
- `rsqueakvm.primitives.input_output`, 33
- `rsqueakvm.primitives.mirror`, 33
- `rsqueakvm.primitives.misc`, 34
- `rsqueakvm.primitives.storage`, 34
- `rsqueakvm.primitives.system`, 34
- `rsqueakvm.squeakimage`, 46
- `rsqueakvm.storage`, 51
- `rsqueakvm.storage_classes`, 58
- `rsqueakvm.storage_contexts`, 59
- `rsqueakvm.util`, 38
- `rsqueakvm.util.bitmanipulation`, 35
- `rsqueakvm.util.cells`, 35
- `rsqueakvm.util.dialog`, 35
- `rsqueakvm.util.logparser`, 35
- `rsqueakvm.util.platform_calls`, 36
- `rsqueakvm.util.progress`, 36
- `rsqueakvm.util.shell`, 36
- `rsqueakvm.util.stream`, 37
- `rsqueakvm.util.system`, 37
- `rsqueakvm.util.version`, 37
- `rsqueakvm.wrapper`, 65



## A

- AbstractCachingShadow (class in *rsqueakvm.storage*), 51
- AbstractGenericShadow (class in *rsqueakvm.storage*), 51
- AbstractStrategy (class in *rsqueakvm.storage*), 51
- activate() (*QuasiConstantMixin* method), 35
- activate\_debugging() (in module *rsqueakvm.interpreter\_debugging*), 44
- activateClosure() (in module *rsqueakvm.primitives.block\_closure*), 33
- activating\_init() (in module *rsqueakvm.interpreter\_debugging*), 44
- active\_context() (in module *rsqueakvm.main*), 44
- active\_process() (*SchedulerWrapper* method), 67
- add() (*PluginRegistry* static method), 33
- add\_last\_link() (*LinkedListWrapper* method), 66
- add\_special\_properties() (in module *rsqueakvm.objspace*), 46
- addbridge() (*Trace* method), 35
- after\_compile() (*JitIface* method), 26
- after\_compile\_bridge() (*JitIface* method), 26
- all\_statements() (*StatementCache* method), 23
- AllNilStrategy (class in *rsqueakvm.storage*), 52
- alter\_sql() (in module *rsqueakvm.plugins.database.model*), 22
- AncientReader (class in *rsqueakvm.squeakimage*), 46
- append() (*AbstractStrategy* method), 51
- append() (*AllNilStrategy* method), 52
- append() (*CharacterOrNilStrategy* method), 53
- append() (*FloatOrNilStrategy* method), 54
- append() (*ListStrategy* method), 55
- append() (*SmallIntegerOrNilStrategy* method), 56
- append() (*WeakListStrategy* method), 57
- argument\_strings() (*ContextPartShadow* method), 59
- as\_cached\_object\_get\_shadow() (*W\_PointersObject* method), 18
- as\_class\_get\_shadow() (*W\_PointersObject* method), 18
- as\_context\_get\_shadow() (*W\_PointersObject* method), 18
- as\_g\_object() (*ImageChunk* method), 48
- as\_methoddict\_get\_shadow() (*W\_PointersObject* method), 18
- as\_observed\_get\_shadow() (*W\_PointersObject* method), 18
- as\_repr\_string() (*W\_Object* method), 6
- as\_special\_get\_shadow() (*W\_PointersObject* method), 18
- as\_string() (*GenericObject* method), 47
- as\_string() (*W\_CompiledMethod* method), 11
- ask\_question() (in module *rsqueakvm.util.dialog*), 35
- assert\_class() (in module *rsqueakvm.primitives*), 34
- assert\_pointers() (in module *rsqueakvm.primitives*), 34
- assert\_strategy() (*W\_PointersObject* method), 18
- assert\_valid\_index() (in module *rsqueakvm.primitives*), 34
- assert\_valid\_inst\_index() (in module *rsqueakvm.primitives*), 34
- assign\_prebuilt\_constants() (*BaseReaderStrategy* method), 46
- AssociationWrapper (class in *rsqueakvm.wrapper*), 65
- at0() (*VarsizedWrapper* method), 67
- at0() (*W\_AbstractFloat* method), 14
- at0() (*W\_BlockClosure* method), 8
- at0() (*W\_BytesObject* method), 19
- at0() (*W\_Character* method), 9
- at0() (*W\_CompiledMethod* method), 11
- at0() (*W\_DisplayBitmap* method), 13
- at0() (*W\_LargeIntegerBig* method), 15
- at0() (*W\_LargeIntegerWord* method), 16
- at0() (*W\_Object* method), 6
- at0() (*W\_PointersObject* method), 18

at0 () (*W\_WordsObject method*), 20  
 atput0 () (*VarsizedWrapper method*), 67  
 atput0 () (*W\_AbstractFloat method*), 14  
 atput0 () (*W\_BlockClosure method*), 8  
 atput0 () (*W\_BytesObject method*), 20  
 atput0 () (*W\_Character method*), 10  
 atput0 () (*W\_CompiledMethod method*), 11  
 atput0 () (*W\_DisplayBitmap method*), 13  
 atput0 () (*W\_LargeIntegerBig method*), 15  
 atput0 () (*W\_LargeIntegerWord method*), 16  
 atput0 () (*W\_Object method*), 6  
 atput0 () (*W\_PointersObject method*), 18  
 atput0 () (*W\_WordsObject method*), 21  
 attach\_s\_class () (*ClassShadow method*), 58

## B

BaseReaderStrategy (class *in rsqueakvm.squeakimage*), 46  
 be\_32bit () (*Stream method*), 37  
 be\_64bit () (*Stream method*), 37  
 become () (*AbstractGenericShadow method*), 51  
 become () (*AbstractStrategy method*), 52  
 become () (*ContextPartShadow method*), 59  
 become () (*MethodDictionaryShadow method*), 59  
 become () (*ShadowMixin method*), 55  
 become () (*W\_AbstractObjectWithIdentityHash method*), 6  
 become () (*W\_Object method*), 6  
 before\_compile () (*JitIface method*), 26  
 before\_compile\_bridge () (*JitIface method*), 26  
 bind\_query\_argument () (*SQLCursor method*), 23  
 bits () (*FormWrapper method*), 66  
 BitSplitter (class *in rsqueakvm.util.bitmanipulation*), 35  
 BlockCannotReturnError, 40  
 build () (*AssociationWrapper static method*), 65  
 build () (*ListEntry static method*), 54  
 build\_block\_context () (*ContextPartShadow static method*), 59  
 build\_method\_context () (*ContextPartShadow static method*), 59  
 bytecode\_implementation () (*in module rsqueakvm.interpreter\_bytecodes*), 43  
 bytecode\_string () (*W\_CompiledMethod method*), 11  
 bytecodeoffset () (*W\_CompiledMethod method*), 11  
 bytecodePrimAdd () (*ContextPartShadow method*), 59  
 bytecodePrimAt () (*ContextPartShadow method*), 59  
 bytecodePrimAtEnd () (*ContextPartShadow method*), 60

bytecodePrimAtPut () (*ContextPartShadow method*), 60  
 bytecodePrimBitAnd () (*ContextPartShadow method*), 60  
 bytecodePrimBitOr () (*ContextPartShadow method*), 60  
 bytecodePrimBitShift () (*ContextPartShadow method*), 60  
 bytecodePrimBlockCopy () (*ContextPartShadow method*), 60  
 bytecodePrimClass () (*ContextPartShadow method*), 60  
 bytecodePrimDiv () (*ContextPartShadow method*), 60  
 bytecodePrimDivide () (*ContextPartShadow method*), 60  
 bytecodePrimDo () (*ContextPartShadow method*), 60  
 bytecodePrimEqual () (*ContextPartShadow method*), 60  
 bytecodePrimEquivalent () (*ContextPartShadow method*), 60  
 bytecodePrimGreaterOrEqual () (*ContextPartShadow method*), 60  
 bytecodePrimGreaterThan () (*ContextPartShadow method*), 60  
 bytecodePrimLessOrEqual () (*ContextPartShadow method*), 60  
 bytecodePrimLessThan () (*ContextPartShadow method*), 60  
 bytecodePrimMakePoint () (*ContextPartShadow method*), 60  
 bytecodePrimMod () (*ContextPartShadow method*), 60  
 bytecodePrimMultiply () (*ContextPartShadow method*), 60  
 bytecodePrimNew () (*ContextPartShadow method*), 60  
 bytecodePrimNewWithArg () (*ContextPartShadow method*), 60  
 bytecodePrimNext () (*ContextPartShadow method*), 60  
 bytecodePrimNextPut () (*ContextPartShadow method*), 60  
 bytecodePrimNotEqual () (*ContextPartShadow method*), 60  
 bytecodePrimPointX () (*ContextPartShadow method*), 60  
 bytecodePrimPointY () (*ContextPartShadow method*), 60  
 bytecodePrimSize () (*ContextPartShadow method*), 60  
 bytecodePrimSubtract () (*ContextPartShadow method*), 60

bytecodePrimValue() (ContextPartShadow method), 60  
 bytecodePrimValueWithArg() (ContextPartShadow method), 60  
 bytes2dword\_with\_correct\_endianness() (Stream method), 37  
 bytes2qword\_with\_correct\_endianness() (Stream method), 37  
 bytes\_per\_slot (W\_BlockClosure attribute), 8  
 bytes\_per\_slot (W\_BytesObject attribute), 20  
 bytes\_per\_slot (W\_CompiledMethod attribute), 11  
 bytes\_per\_slot (W\_LargeInteger attribute), 15  
 bytes\_per\_slot (W\_Object attribute), 6  
 bytesize() (W\_Object method), 6

## C

CachedObjectShadow (class in rsqueakvm.storage), 53  
 calculate\_and\_cache() (in module rsqueakvm.model.base), 8  
 calculate\_exposed\_size\_for\_big\_int() (in module rsqueakvm.model.numeric), 18  
 call() (Plugin method), 29  
 callPrimitiveBytecode() (ContextPartShadow method), 60  
 can\_become() (W\_AbstractObjectWithIdentityHash method), 6  
 can\_become() (W\_DisplayBitmap method), 13  
 can\_read() (W\_SocketHandle method), 30  
 CConfig (class in rsqueakvm.plugins.database), 23  
 Cell() (in module rsqueakvm.util.cells), 35  
 change\_class() (W\_AbstractObjectWithClassReference method), 5  
 change\_class() (W\_Object method), 6  
 change\_class() (W\_PointersObject method), 18  
 changed() (AbstractCachingShadow method), 51  
 changed() (ClassShadow method), 58  
 changed() (QuasiConstantMixin method), 35  
 changed() (VersionMixin method), 37  
 changed() (W\_BlockClosure method), 8  
 CharacterOrNilStrategy (class in rsqueakvm.storage), 53  
 check\_for\_interrupts() (Interpreter method), 42  
 check\_index\_fetch() (SimpleStorageStrategy method), 56  
 check\_index\_range() (SimpleStorageStrategy method), 56  
 check\_index\_store() (SimpleStorageStrategy method), 56  
 check\_sigusr() (Interpreter method), 42  
 choose\_reader\_strategy() (ImageReader method), 48  
 chrs2int() (in module rsqueakvm.util.stream), 37  
 chrs2long() (in module rsqueakvm.util.stream), 37  
 chunklist (ImageReader attribute), 48  
 chunks (ImageReader attribute), 48  
 class\_name() (WDBObject method), 22  
 class\_shadow() (W\_AbstractImmutable\_PointersObject method), 24  
 class\_shadow() (W\_Object method), 6  
 classname() (GenericObject method), 47  
 classname() (W\_Object method), 6  
 ClassShadow (class in rsqueakvm.storage\_classes), 58  
 ClassShadowError, 59  
 CleanExit, 40  
 clone() (W\_AbstractFloat method), 14  
 clone() (W\_BlockClosure method), 8  
 clone() (W\_BytesObject method), 20  
 clone() (W\_Character method), 10  
 clone() (W\_CompiledMethod method), 11  
 clone() (W\_DisplayBitmap method), 13  
 clone() (W\_LargeIntegerBig method), 16  
 clone() (W\_LargeIntegerWord method), 16  
 clone() (W\_Object method), 7  
 clone() (W\_PointersObject method), 18  
 clone() (W\_SmallInteger method), 17  
 clone() (W\_WordsObject method), 21  
 close() (DBManager method), 23  
 close() (LogFile method), 29  
 close() (SDLDisplay method), 39  
 close() (SQLConnection method), 23  
 close() (SQLCursor method), 23  
 close() (Statement method), 23  
 close() (Stream method), 37  
 close() (W\_SocketHandle method), 30  
 cmd() (in module rsqueakvm.util.shell), 36  
 compactclasses (ImageReader attribute), 48  
 compare\_ascii() (in module rsqueakvm.plugins.misc\_primitive\_plugin), 29  
 compare\_collated() (in module rsqueakvm.plugins.misc\_primitive\_plugin), 29  
 compile\_code() (in module rsqueakvm.main), 44  
 compiled\_in() (W\_CompiledMethod method), 11  
 CompiledMethodHeader (class in rsqueakvm.model.compiled\_methods), 10  
 completer() (in module rsqueakvm.util.shell), 36  
 compute\_frame\_size() (W\_CompiledMethod method), 11  
 Config (class in rsqueakvm.main), 44  
 configure\_stream() (ImageVersion method), 48  
 connect() (DBManager method), 23  
 connect() (SQLConnection method), 23  
 connect() (W\_SocketHandle method), 30  
 connection() (DBManager method), 23

`constant_compiledin_class()`  
     (*W\_CompiledMethod* method), 11  
`constant_lookup_class()` (*W\_CompiledMethod*  
     method), 11  
`contained_type` (*CharacterOrNilStrategy* attribute),  
     53  
`contained_type` (*FloatOrNilStrategy* attribute), 54  
`contained_type` (*SmallIntegerOrNilStrategy* at-  
     tribute), 56  
`ContextPartShadow` (class in  
     *rsqueakvm.storage\_contexts*), 59  
`ContextState` (class in *rsqueakvm.storage\_contexts*),  
     65  
`ContextSwitchException`, 41  
`continue_read_header()` (*BaseReaderStrategy*  
     method), 46  
`continue_read_header()` (*SpurReader* method),  
     50  
`convert_instspec_to_spur()` (*SpurIm-*  
     *ageWriter* method), 49  
`convert_to_bytes_layout()` (*W\_WordsObject*  
     method), 21  
`copy_pixels()` (*SDLDisplay* method), 39  
`CorruptImageError`, 40  
`create_context()` (in module *rsqueakvm.main*), 44  
`create_display_bitmap()` (*FormWrapper*  
     method), 66  
`create_frame()` (*W\_BlockClosure* method), 8  
`create_frame()` (*W\_CompiledMethod* method), 11  
`create_image()` (*ImageReader* method), 48  
`create_process()` (in module *rsqueakvm.main*), 44  
`create_sql()` (in module  
     *rsqueakvm.plugins.database.model*), 22  
`create_table_if_neccessary()`  
     (*WDBObject\_State* method), 22  
`create_toplevel_context()` (*Interpreter*  
     method), 42  
`create_window_and_renderer()` (*SDLDisplay*  
     method), 39  
`CriticalSectionWrapper` (class in  
     *rsqueakvm.wrapper*), 65  
`current_gc_old_mem()` (in module  
     *rsqueakvm.primitives.system*), 34  
`current_gc_time()` (in module  
     *rsqueakvm.primitives.system*), 34  
`current_gc_total_mem()` (in module  
     *rsqueakvm.primitives.system*), 34  
`current_gc_young_mem()` (in module  
     *rsqueakvm.primitives.system*), 34  
`cursor()` (*DBManager* method), 23  
`cursor()` (*SQLConnection* method), 23  
`cursor_words_to_bytes()` (*SDLCursorClass*  
     method), 39

## D

`db()` (*Shell* method), 36  
`DBManager` (class in *rsqueakvm.plugins.database*), 23  
`DBType` (class in *rsqueakvm.plugins.database.model*),  
     22  
`deactivate()` (*QuasiConstantMixin* method), 35  
`debug_bytecode()` (*ContextPartShadow* method),  
     60  
`DebugMergePoint()` (in module  
     *rsqueakvm.plugins.vmdebugging.model*),  
     26  
`decode_alternate_compiled_method_header()`  
     (in module *rsqueakvm.constants*), 38  
`decode_compiled_method_header()` (in mod-  
     ule *rsqueakvm.constants*), 38  
`decode_pointers()` (*ImageReader* method), 48  
`decode_pointers()` (*NonSpurReader* method), 48  
`decode_pointers()` (*SpurReader* method), 50  
`default_value()` (*SimpleStorageStrategy* method),  
     56  
`defer_updates()` (*NullDisplay* method), 38  
`defer_updates()` (*SDLDisplay* method), 39  
`delete()` (*AbstractStrategy* method), 52  
`delete()` (*AllNilStrategy* method), 52  
`delete()` (*CharacterOrNilStrategy* method), 53  
`delete()` (*FloatOrNilStrategy* method), 54  
`delete()` (*ListStrategy* method), 55  
`delete()` (*SmallIntegerOrNilStrategy* method), 56  
`delete()` (*WeakListStrategy* method), 57  
`depth()` (*FormWrapper* method), 66  
`dequeue_event()` (*SDLDisplay* method), 39  
`destroy()` (*W\_SocketHandle* method), 30  
`detach_s_class()` (*ClassShadow* method), 58  
`disabled_names` (*PluginRegistry* attribute), 33  
`disableJitlog()` (in module  
     *rsqueakvm.plugins.profiler\_plugin*), 30  
`disableProfiler()` (in module  
     *rsqueakvm.plugins.profiler\_plugin*), 30  
`display()` (*ObjSpace* method), 45  
`display()` (*W\_DisplayBitmap* method), 13  
`doubleExtendedDoAnythingBytecode()` (*Con-*  
     *textPartShadow* method), 60  
`duplicateTopBytecode()` (*ContextPartShadow*  
     method), 60

## E

`elidable_for_version()` (in module  
     *rsqueakvm.util.version*), 38  
`elidable_for_version_iff()` (in module  
     *rsqueakvm.util.version*), 38  
`empty_object()` (in module *rsqueakvm.objspace*), 46  
`empty_stack` (*W\_BlockClosure* attribute), 8  
`empty_storage_type()` (*StrategyFactory* method),  
     57



- empty\_symbol() (in module *rsqueakvm.objspace*), 46
- enabled\_names (PluginRegistry attribute), 33
- enabled\_plugins (PluginRegistry attribute), 33
- enableJitlog() (in module *rsqueakvm.plugins.profiler\_plugin*), 30
- enableProfiler() (in module *rsqueakvm.plugins.profiler\_plugin*), 30
- end\_pc() (W\_CompiledMethod method), 11
- ensure\_path() (Config method), 44
- ensure\_socket() (in module *rsqueakvm.plugins.socket\_plugin*), 31
- enter() (CriticalSectionWrapper method), 65
- enter\_virtual\_frame() (ContextPartShadow method), 60
- entry\_point() (in module *rsqueakvm.main*), 44
- event\_time\_now() (Interpreter method), 42
- exception\_type (BlockCannotReturnError attribute), 40
- exception\_type (ClassShadowError attribute), 59
- exception\_type (FatalError attribute), 41
- exception\_type (MissingBytecode attribute), 41
- exception\_type (PrimitiveFailedError attribute), 41
- exception\_type (PrimitiveNotYetWrittenError attribute), 41
- exception\_type (SimulatedPrimitiveFailedError attribute), 41
- exception\_type (SmalltalkException attribute), 41
- exception\_type (UnwrappingError attribute), 41
- exception\_type (WrapperException attribute), 41
- exception\_type (WrappingError attribute), 41
- excess\_signals() (SemaphoreWrapper method), 67
- executable\_path() (ObjSpace method), 45
- execute() (DBManager method), 23
- execute() (SQLConnection method), 23
- execute() (SQLCursor method), 23
- execute\_context() (in module *rsqueakvm.main*), 44
- Exit, 40
- exit() (CriticalSectionWrapper method), 65
- exitFromHeadlessExecution() (ContextPartShadow method), 60
- expected\_argument\_count() (ContextPartShadow method), 61
- expose\_also\_as() (in module *rsqueakvm.primitives*), 34
- expose\_alternative\_primitive() (in module *rsqueakvm.primitives*), 34
- expose\_mirror\_primitive() (in module *rsqueakvm.primitives.mirror*), 33
- expose\_options() (in module *rsqueakvm.util.system*), 37
- expose\_primitive() (in module *rsqueakvm.primitives*), 34
- expose\_primitive() (Plugin method), 29
- expose\_primitive() (SocketPlugin method), 30
- ExtendableStrategyMetaclass (class in *rsqueakvm.storage*), 54
- extendedPushBytecode() (ContextPartShadow method), 61
- extendedStoreAndPopBytecode() (ContextPartShadow method), 61
- extendedStoreBytecode() (ContextPartShadow method), 61
- external\_stackpointer() (ContextPartShadow method), 61
- ExtraContextAttributes (class in *rsqueakvm.storage\_contexts*), 65
- extract\_traces() (in module *rsqueakvm.util.logparser*), 35
- ## F
- fake\_bytes\_left() (in module *rsqueakvm.primitives.misc*), 34
- FatalError, 41
- fetch() (AbstractStrategy method), 52
- fetch() (AllNilStrategy method), 52
- fetch() (CachedObjectShadow method), 53
- fetch() (CharacterOrNilStrategy method), 53
- fetch() (ContextPartShadow method), 61
- fetch() (FloatOrNilStrategy method), 54
- fetch() (ListStrategy method), 55
- fetch() (SmallIntegerOrNilStrategy method), 56
- fetch() (W\_AbstractFloat method), 14
- fetch() (W\_AbstractImmutable\_PointersObject method), 24
- fetch() (W\_BlockClosure method), 8
- fetch() (W\_Character method), 10
- fetch() (WDBObject method), 22
- fetch() (W\_Immutable\_PointersObject method), 25
- fetch() (W\_Object method), 7
- fetch() (W\_PointersObject method), 18
- fetch() (WeakListStrategy method), 57
- fetch\_all() (AbstractStrategy method), 52
- fetch\_all() (AllNilStrategy method), 52
- fetch\_all() (CharacterOrNilStrategy method), 53
- fetch\_all() (FloatOrNilStrategy method), 54
- fetch\_all() (ListStrategy method), 55
- fetch\_all() (SmallIntegerOrNilStrategy method), 56
- fetch\_all() (W\_BlockClosure method), 9
- fetch\_all() (W\_PointersObject method), 18
- fetch\_all() (WeakListStrategy method), 57
- fetch\_block\_context() (ContextPartShadow method), 61
- fetch\_bytecode() (ContextPartShadow method), 61
- fetch\_bytecode() (W\_CompiledMethod method), 11

- `fetch_context_part()` (*ContextPartShadow method*), 61
  - `fetch_method_context()` (*ContextPartShadow method*), 61
  - `fetch_next_bytecode()` (*ContextPartShadow method*), 61
  - `fileno()` (*LogFile method*), 29
  - `FilePlugin` (class in *rsqueakvm.plugins.file\_plugin*), 27
  - `fillin()` (*GenericObject method*), 47
  - `fillin()` (*W\_AbstractFloat method*), 14
  - `fillin()` (*W\_AbstractObjectWithClassReference method*), 5
  - `fillin()` (*W\_AbstractObjectWithIdentityHash method*), 6
  - `fillin()` (*W\_BlockClosure method*), 9
  - `fillin()` (*W\_BytesObject method*), 20
  - `fillin()` (*W\_Character method*), 10
  - `fillin()` (*W\_CompiledMethod method*), 11
  - `fillin()` (*W\_LargeIntegerBig method*), 16
  - `fillin()` (*W\_LargeIntegerWord method*), 16
  - `fillin()` (*W\_Object method*), 7
  - `fillin()` (*W\_PointersObject method*), 18
  - `fillin()` (*W\_SmallInteger method*), 17
  - `fillin()` (*W\_WordsObject method*), 21
  - `fillin_finalize()` (*BaseReaderStrategy method*), 46
  - `fillin_finalize()` (*GenericObject method*), 47
  - `fillin_finalize()` (*W\_BlockClosure method*), 9
  - `fillin_finalize()` (*W\_Object method*), 7
  - `fillin_fromwords()` (*W\_AbstractFloat method*), 14
  - `fillin_fromwords()` (*W\_Float method*), 15
  - `fillin_w_object()` (*BaseReaderStrategy method*), 46
  - `fillin_w_objects()` (*BaseReaderStrategy method*), 46
  - `fillin_weak()` (*GenericObject method*), 47
  - `fillin_weak()` (*W\_Object method*), 7
  - `fillin_weak()` (*W\_PointersObject method*), 18
  - `fillin_weak_w_object()` (*BaseReaderStrategy method*), 46
  - `fillin_weak_w_objects()` (*BaseReaderStrategy method*), 46
  - `find_executable()` (*Config method*), 44
  - `find_selector()` (*MethodDictionaryShadow method*), 59
  - `find_selectorindex()` (in module *rsqueakvm.constants*), 38
  - `find_symbol()` (*SqueakImage method*), 51
  - `first_link()` (*LinkedListWrapper method*), 66
  - `fix_key_code_case()` (*SDLDisplay method*), 39
  - `fixed_and_indexable_size_for()` (*SpurImageWriter method*), 49
  - `flip()` (*NullDisplay method*), 38
  - `flip()` (*SDLDisplay method*), 39
  - `FloatOrNilStrategy` (class in *rsqueakvm.storage*), 54
  - `flush_method_cache()` (*MethodDictionaryShadow method*), 59
  - `flush_method_caches()` (*ClassShadow method*), 58
  - `flush_to_screen()` (*W\_DisplayBitmap method*), 13
  - `force_rectangle_to_screen()` (*W\_DirectDisplayBitmap method*), 13
  - `force_rectangle_to_screen()` (*W\_MappingDisplayBitmap method*), 14
  - `ForceHeadless` (class in *rsqueakvm.objspace*), 45
  - `format` (*GenericObject attribute*), 47
  - `FormWrapper` (class in *rsqueakvm.wrapper*), 66
  - `frame_size_for()` (*SpurImageWriter method*), 49
  - `FREE_OBJECT_CLASS_INDEX_PUN` (*SpurReader attribute*), 50
  - `fresh_virtualizable()` (in module *rsqueakvm.storage\_contexts*), 65
  - `FreshReturn`, 41
  - `from_words_object()` (in module *rsqueakvm.model.display*), 14
  - `full_damage()` (*SDLDisplay method*), 39
  - `full_stacksize()` (*ContextPartShadow method*), 61
  - `func()` (in module *rsqueakvm.plugins.profiler\_plugin*), 30
  - `func()` (in module *rsqueakvm.primitives.array\_stream*), 33
  - `func()` (in module *rsqueakvm.primitives.block\_closure*), 33
  - `func()` (in module *rsqueakvm.primitives.input\_output*), 33
  - `func()` (in module *rsqueakvm.primitives.misc*), 34
  - `func()` (in module *rsqueakvm.primitives.storage*), 34
  - `func()` (in module *rsqueakvm.primitives.system*), 34
- ## G
- `g_class_of()` (*BaseReaderStrategy method*), 46
  - `g_class_of()` (*ImageReader method*), 48
  - `g_class_of()` (*NonSpurReader method*), 48
  - `g_class_of()` (*SpurReader method*), 50
  - `generalized_strategy_for()` (*AllNilStrategy method*), 52
  - `generalized_strategy_for()` (*CharacterOrNilStrategy method*), 53
  - `generalized_strategy_for()` (*FloatOrNilStrategy method*), 54
  - `generalized_strategy_for()` (*SmallIntegerOrNilStrategy method*), 56

`generate_fixed_immutable_subclass()` (in module *rsqueakvm.plugins.immutability.pointers*), 25  
`GenericObject` (class in *rsqueakvm.squeakimage*), 47  
`get()` (*QuasiConstantMixin* method), 35  
`get()` (*StrongListEntry* method), 57  
`get()` (*WeakListEntry* method), 57  
`get_bytes()` (*GenericObject* method), 47  
`get_bytes_of()` (*BaseReaderStrategy* method), 46  
`get_class()` (*GenericObject* method), 47  
`get_clipboard_text()` (*SDLDisplay* method), 39  
`get_column_type()` (*WDBObject\_State* method), 22  
`get_column_types()` (*WDBObject\_State* method), 22  
`get_connection()` (*DBManager* method), 23  
`get_display_bitmap()` (*FormWrapper* method), 66  
`get_dropevent()` (*SDLDisplay* method), 39  
`get_dropped_filename()` (*NullDisplay* method), 38  
`get_dropped_filename()` (*SDLDisplay* method), 39  
`get_exedir()` (*Config* method), 44  
`get_extra_data()` (*ContextPartShadow* method), 61  
`get_fallback()` (*ContextPartShadow* method), 61  
`get_file()` (in module *rsqueakvm.util.dialog*), 35  
`get_hash()` (*GenericObject* method), 47  
`get_holder()` (*StatementCache* method), 23  
`get_identifier_string()` (*W\_CompiledMethod* method), 11  
`get_image_name()` (*ObjSpace* method), 45  
`get_instance_kind()` (*ClassShadow* method), 58  
`get_instances_array()` (in module *rsqueakvm.primitives.storage*), 34  
`get_instances_array_gc()` (in module *rsqueakvm.primitives.storage*), 34  
`get_instances_array_trace()` (in module *rsqueakvm.primitives.storage*), 34  
`get_int_parameter()` (in module *rsqueakvm.main*), 44  
`get_last_lookup()` (*SocketPlugin* method), 30  
`get_memory_usage()` (in module *rsqueakvm.util.platform\_calls*), 36  
`get_modifier_mask()` (*SDLDisplay* method), 39  
`get_mouse_event_buttons_and_mods()` (*SDLDisplay* method), 39  
`get_next_event()` (*NullDisplay* method), 38  
`get_next_event()` (*SDLDisplay* method), 39  
`get_next_key_event()` (*SDLDisplay* method), 39  
`get_next_mouse_event()` (*SDLDisplay* method), 39  
`get_next_mouse_wheel_event()` (*SDLDisplay* method), 39  
`get_or_make()` (*StatementCache* method), 24  
`get_parameter()` (in module *rsqueakvm.main*), 44  
`get_pixelbuffer()` (*NullDisplay* method), 38  
`get_plain_pixelbuffer()` (*NullDisplay* method), 38  
`get_plugins()` (in module *rsqueakvm.plugins*), 33  
`get_pointers()` (*GenericObject* method), 47  
`get_printable_location()` (in module *rsqueakvm.interpreter*), 43  
`get_process_list()` (*SchedulerWrapper* method), 67  
`get_ruints()` (*GenericObject* method), 47  
`get_special_selector()` (*ObjSpace* method), 45  
`get_stacksize()` (*W\_BlockClosure* method), 9  
`get_state()` (*ContextPartShadow* method), 61  
`get_storage()` (*AbstractCachingShadow* method), 51  
`get_storage()` (*AbstractGenericShadow* method), 51  
`get_storage()` (*AbstractStrategy* method), 52  
`get_storage()` (*AllNilStrategy* method), 52  
`get_storage()` (*CachedObjectShadow* method), 53  
`get_storage()` (*CharacterOrNilStrategy* method), 53  
`get_storage()` (*ClassShadow* method), 58  
`get_storage()` (*ContextPartShadow* method), 61  
`get_storage()` (*FloatOrNilStrategy* method), 54  
`get_storage()` (*ListStrategy* method), 55  
`get_storage()` (*MethodDictionaryShadow* method), 59  
`get_storage()` (*ObserveeShadow* method), 55  
`get_storage()` (*SimpleStorageStrategy* method), 56  
`get_storage()` (*SmallIntegerOrNilStrategy* method), 56  
`get_storage()` (*WeakListStrategy* method), 57  
`get_system_attribute()` (*ObjSpace* method), 45  
`getblockmethod()` (*Interpreter* method), 42  
`getbytes()` (*W\_BytesObject* method), 20  
`getbytes()` (*W\_CompiledMethod* method), 11  
`getchar()` (*W\_BytesObject* method), 20  
`getchar()` (*W\_WordsObject* method), 21  
`getclass()` (*AbstractStrategy* method), 52  
`getclass()` (*W\_AbstractFloat* method), 14  
`getclass()` (*W\_AbstractImmutable\_PointersObject* method), 24  
`getclass()` (*W\_AbstractObjectWithClassReference* method), 5  
`getclass()` (*W\_BlockClosure* method), 9  
`getclass()` (*W\_Character* method), 10  
`getclass()` (*W\_CompiledMethod* method), 11  
`getclass()` (*W\_DisplayBitmap* method), 13  
`getclass()` (*W\_Object* method), 7  
`getclass()` (*W\_PointersObject* method), 18

getclass() (*W\_SmallInteger method*), 17  
 getclass() (*W\_SocketHandle method*), 30  
 gethash() (*W\_AbstractFloat method*), 14  
 gethash() (*W\_AbstractObjectWithIdentityHash method*), 6  
 gethash() (*W\_Character method*), 10  
 gethash() (*W\_Object method*), 7  
 gethash() (*W\_SmallInteger method*), 17  
 getheader() (*W\_CompiledMethod method*), 11  
 getliteral() (*W\_CompiledMethod method*), 11  
 getliteralize() (*W\_CompiledMethod method*), 11  
 getname() (*AbstractStrategy method*), 52  
 getname() (*ClassShadow method*), 58  
 getrbigint() (*W\_BytesObject method*), 20  
 getreceiverclass() (*Interpreter method*), 42  
 gettemp() (*ContextPartShadow method*), 61  
 gettemp\_block\_context() (*ContextPartShadow method*), 61  
 gettemp\_method\_context() (*ContextPartShadow method*), 61  
 getvalue() (*W\_AbstractFloat method*), 14  
 getvalue() (*W\_Float method*), 15  
 getvalue() (*W\_MutableFloat method*), 17  
 getword() (*W\_16BitDisplayBitmap method*), 13  
 getword() (*W\_DisplayBitmap method*), 13  
 getword() (*W\_Object method*), 7  
 getword() (*W\_WordsObject method*), 21  
 getwords() (*W\_WordsObject method*), 21  
 GuardOp() (in module *rsqueakvm.plugins.vmdebugging.model*), 26  
 guess\_classname() (*W\_AbstractFloat method*), 15  
 guess\_classname() (*W\_AbstractObjectWithClassReference method*), 5  
 guess\_classname() (*W\_Character method*), 10  
 guess\_classname() (*W\_CompiledMethod method*), 11  
 guess\_classname() (*W\_DisplayBitmap method*), 13  
 guess\_classname() (*W\_Object method*), 7  
 guess\_classname() (*W\_PointersObject method*), 19  
 guess\_classname() (*W\_SmallInteger method*), 17  
 guess\_classname() (*W\_SocketHandle method*), 30  
 guess\_containing\_classname() (*W\_CompiledMethod method*), 11  
  
**H**  
 handle\_keyboard\_event() (*SDLDisplay method*), 39  
 handle\_mouse\_button() (*SDLDisplay method*), 39  
 handle\_mouse\_move() (*SDLDisplay method*), 39  
 handle\_textinput\_event() (*SDLDisplay method*), 40  
 handle\_wndevent() (*SDLDisplay method*), 40  
 handles\_become() (*AbstractStrategy method*), 52  
 has\_class() (*W\_Object method*), 7  
 has\_class() (*W\_PointersObject method*), 19  
 has\_clipboard\_text() (*NullDisplay method*), 38  
 has\_clipboard\_text() (*SDLDisplay method*), 40  
 has\_interrupts\_pending() (*NullDisplay method*), 38  
 has\_interrupts\_pending() (*SDLDisplay method*), 40  
 has\_primitive\_bit\_set() (*SpurCompiledMethodHeader static method*), 10  
 has\_queued\_events() (*SDLDisplay method*), 40  
 has\_s\_sender() (*ContextPartShadow method*), 61  
 has\_space() (*W\_PointersObject method*), 19  
 has\_strategy() (*W\_PointersObject method*), 19  
 hash (*GenericObject attribute*), 47  
 hash (*W\_AbstractObjectWithIdentityHash attribute*), 6  
 headers\_for\_hash\_numfields() (*SpurImageWriter method*), 49  
 headersize() (*W\_CompiledMethod method*), 11  
 height() (*FormWrapper method*), 66  
 help() (*Shell method*), 36  
 home\_is\_self() (*ContextPartShadow method*), 61  
 home\_is\_self\_block\_context() (*ContextPartShadow method*), 61  
 home\_is\_self\_method\_context() (*ContextPartShadow method*), 61  
  
**I**  
 image\_header\_size (*SpurImageWriter attribute*), 49  
 ImageChunk (*class in rsqueakvm.squeakimage*), 48  
 ImageReader (*class in rsqueakvm.squeakimage*), 48  
 ImageVersion (*class in rsqueakvm.squeakimage*), 48  
 ImmutabilityPlugin (*class in rsqueakvm.plugins.immutability\_plugin*), 27  
 immutable\_class() (in module *rsqueakvm.plugins.immutability*), 25  
 inherits\_from() (*ClassShadow method*), 58  
 init\_column\_types\_if\_neccessary() (*W\_DBObjct\_State method*), 22  
 init\_compactclassesarray() (*BaseReaderStrategy method*), 46  
 init\_compactclassesarray() (*NonSpurReader method*), 48  
 init\_from\_arguments() (*Config method*), 44  
 init\_from\_ini() (*Config method*), 44  
 init\_g\_class() (*GenericObject method*), 47  
 init\_g\_object() (*BaseReaderStrategy method*), 46



[init\\_g\\_objects\(\)](#) (*BaseReaderStrategy method*), [47](#)  
[init\\_g\\_objects\(\)](#) (*NonSpurReader method*), [48](#)  
[init\\_pointers\(\)](#) (*GenericObject method*), [47](#)  
[init\\_special\\_objects\\_mapping\(\)](#) (*in module rsqueakvm.constants*), [38](#)  
[init\\_system\\_attributes\(\)](#) (*ObjSpace method*), [45](#)  
[init\\_temps\\_and\\_stack\(\)](#) (*ContextPartShadow method*), [61](#)  
[init\\_w\\_object\(\)](#) (*BaseReaderStrategy method*), [47](#)  
[init\\_w\\_object\(\)](#) (*GenericObject method*), [47](#)  
[init\\_w\\_objects\(\)](#) (*BaseReaderStrategy method*), [47](#)  
[initialip\(\)](#) (*ContextPartShadow method*), [61](#)  
[initialize\(\)](#) (*GenericObject method*), [48](#)  
[initialize\\_bytecode\\_names\(\)](#) (*in module rsqueakvm.interpreter\_bytecodes*), [43](#)  
[initialize\\_bytecode\\_table\(\)](#) (*in module rsqueakvm.interpreter\_bytecodes*), [43](#)  
[initialize\\_char\(\)](#) (*GenericObject method*), [48](#)  
[initialize\\_int\(\)](#) (*GenericObject method*), [48](#)  
[initialize\\_literals\(\)](#) (*W\_CompiledMethod method*), [12](#)  
[initialize\\_methoddict\(\)](#) (*ClassShadow method*), [58](#)  
[initialize\\_return\\_bytecodes\(\)](#) (*in module rsqueakvm.interpreter\_bytecodes*), [43](#)  
[initialize\\_temps\(\)](#) (*ContextPartShadow method*), [61](#)  
[insert\(\)](#) (*AbstractStrategy method*), [52](#)  
[insert\(\)](#) (*AllNilStrategy method*), [52](#)  
[insert\(\)](#) (*CharacterOrNilStrategy method*), [53](#)  
[insert\(\)](#) (*FloatOrNilStrategy method*), [54](#)  
[insert\(\)](#) (*ListStrategy method*), [55](#)  
[insert\(\)](#) (*SmallIntegerOrNilStrategy method*), [56](#)  
[insert\(\)](#) (*WeakListStrategy method*), [57](#)  
[insert\\_class\\_into\\_classtable\(\)](#) (*SpurImageWriter method*), [49](#)  
[insert\\_padding\\_event\(\)](#) (*SDLDisplay method*), [40](#)  
[insert\\_sql\(\)](#) (*in module rsqueakvm.plugins.database.model*), [22](#)  
[installmethod\(\)](#) (*ClassShadow method*), [58](#)  
[instance](#) (*SDLCursorClass attribute*), [39](#)  
[instances\\_array\(\)](#) (*ContextPartShadow method*), [61](#)  
[instantiate\(\)](#) (*AbstractStrategy method*), [52](#)  
[instantiate\(\)](#) (*NonSpurReader method*), [49](#)  
[instantiate\(\)](#) (*SpurReader method*), [50](#)  
[instantiate\\_strategy\(\)](#) (*StrategyFactory method*), [57](#)  
[instantiate\\_type](#) (*AllNilStrategy attribute*), [52](#)  
[instantiate\\_type](#) (*CachedObjectShadow attribute*), [53](#)  
[instantiate\\_type](#) (*CharacterOrNilStrategy attribute*), [53](#)  
[instantiate\\_type](#) (*ClassShadow attribute*), [58](#)  
[instantiate\\_type](#) (*ContextPartShadow attribute*), [61](#)  
[instantiate\\_type](#) (*FloatOrNilStrategy attribute*), [54](#)  
[instantiate\\_type](#) (*ListStrategy attribute*), [55](#)  
[instantiate\\_type](#) (*MethodDictionaryShadow attribute*), [59](#)  
[instantiate\\_type](#) (*ObserveeShadow attribute*), [55](#)  
[instantiate\\_type](#) (*SmallIntegerOrNilStrategy attribute*), [56](#)  
[instantiate\\_type](#) (*WeakListStrategy attribute*), [57](#)  
[instsize\(\)](#) (*ClassShadow method*), [58](#)  
[instsize\(\)](#) (*W\_BlockClosure method*), [9](#)  
[instsize\(\)](#) (*W\_Object method*), [7](#)  
[instsize\(\)](#) (*W\_PointersObject method*), [19](#)  
[intcache](#) (*ImageReader attribute*), [48](#)  
[interpret\\_toplevel\(\)](#) (*Interpreter method*), [42](#)  
[Interpreter](#) (*class in rsqueakvm.interpreter*), [42](#)  
[IntLocalReturn](#), [42](#)  
[IntNonLocalReturn](#), [42](#)  
[invalidate\(\)](#) (*StatementCache method*), [24](#)  
[invariant\(\)](#) (*W\_AbstractObjectWithClassReference method*), [5](#)  
[invariant\(\)](#) (*W\_AbstractObjectWithIdentityHash method*), [6](#)  
[invariant\(\)](#) (*W\_BytesObject method*), [20](#)  
[invariant\(\)](#) (*W\_Character method*), [10](#)  
[invariant\(\)](#) (*W\_CompiledMethod method*), [12](#)  
[invariant\(\)](#) (*W\_DisplayBitmap method*), [13](#)  
[invariant\(\)](#) (*W\_Object method*), [7](#)  
[invariant\(\)](#) (*W\_PointersObject method*), [19](#)  
[invariant\(\)](#) (*W\_SmallInteger method*), [17](#)  
[invariant\(\)](#) (*W\_WordsObject method*), [21](#)  
[is\\_active\\_process\(\)](#) (*ProcessWrapper method*), [66](#)  
[is\\_array\\_object\(\)](#) (*W\_BytesObject method*), [20](#)  
[is\\_array\\_object\(\)](#) (*W\_CompiledMethod method*), [12](#)  
[is\\_array\\_object\(\)](#) (*W\_DisplayBitmap method*), [13](#)  
[is\\_array\\_object\(\)](#) (*W\_LargeInteger method*), [15](#)  
[is\\_array\\_object\(\)](#) (*W\_Object method*), [7](#)  
[is\\_array\\_object\(\)](#) (*W\_WordsObject method*), [21](#)  
[is\\_ascii\\_order\(\)](#) (*in module rsqueakvm.plugins.misc\_primitive\_plugin*), [29](#)  
[is\\_BlockClosure\\_ensure\(\)](#) (*ContextPartShadow method*), [61](#)  
[is\\_class\(\)](#) (*W\_Object method*), [7](#)

is\_class() (*W\_PointersObject method*), 19  
 is\_closure\_context() (*ContextPartShadow method*), 61  
 is\_closure\_context\_block\_context() (*ContextPartShadow method*), 61  
 is\_closure\_context\_method\_context() (*ContextPartShadow method*), 61  
 is\_control\_key() (*SDLDisplay method*), 40  
 is\_empty\_list() (*LinkedListWrapper method*), 66  
 is\_enabled() (*Plugin method*), 29  
 is\_headless() (*NullDisplay method*), 38  
 is\_headless() (*SDLDisplay method*), 40  
 is\_modifier\_key() (*SDLDisplay method*), 40  
 is\_nil() (*W\_Object method*), 7  
 is\_optional() (*Plugin method*), 29  
 is\_optional() (*ProfilerPlugin method*), 29  
 is\_optional() (*TailcallPlugin method*), 32  
 is\_positive() (*W\_BytesObject method*), 20  
 is\_positive() (*W\_LargeInteger method*), 15  
 is\_positive() (*W\_Object method*), 7  
 is\_positive() (*W\_SmallInteger method*), 17  
 is\_privileged\_index() (*ContextPartShadow method*), 61  
 is\_returned() (*ContextPartShadow method*), 61  
 is\_same\_object() (*W\_AbstractFloat method*), 15  
 is\_same\_object() (*W\_Character method*), 10  
 is\_same\_object() (*W\_DBObject method*), 22  
 is\_same\_object() (*W\_Object method*), 7  
 is\_same\_object() (*W\_SmallInteger method*), 17  
 is\_set() (*QuasiConstantMixin method*), 35  
 is\_shadow() (*AbstractGenericShadow method*), 51  
 is\_shadow() (*AbstractStrategy method*), 52  
 is\_shadow() (*ContextPartShadow method*), 61  
 is\_shadow() (*ShadowMixin method*), 55  
 is\_socket() (*SocketPlugin method*), 30  
 is\_strong\_anyway() (*ListEntry static method*), 54  
 is\_tracing() (*Interpreter method*), 42  
 is\_weak() (*W\_PointersObject method*), 19  
 isbiginteger() (*BaseReaderStrategy method*), 47  
 isblockclosure() (*NonSpurReader method*), 49  
 isblockclosure() (*SpurReader method*), 50  
 isbytes() (*NonSpurReader method*), 49  
 isbytes() (*SpurReader method*), 50  
 ischar() (*NonSpurReader method*), 49  
 ischar() (*SpurReader method*), 50  
 iscompact() (*ImageChunk method*), 48  
 iscompiledmethod() (*NonSpurReader method*), 49  
 iscompiledmethod() (*SpurReader method*), 50  
 isfloat() (*BaseReaderStrategy method*), 47  
 isinitialized() (*GenericObject method*), 48  
 isipv4() (*W\_SocketHandle method*), 30  
 isipv6() (*W\_SocketHandle method*), 30  
 islargeinteger() (*BaseReaderStrategy method*), 47

isopen() (*LogFile method*), 29  
 ispointers() (*NonSpurReader method*), 49  
 ispointers() (*SpurReader method*), 50  
 issignedinteger() (*BaseReaderStrategy method*), 47  
 isunsignedinteger() (*BaseReaderStrategy method*), 47  
 isvariable() (*ClassShadow method*), 58  
 isweak() (*GenericObject method*), 48  
 isweak() (*NonSpurReader method*), 49  
 isweak() (*SpurReader method*), 50  
 iswords() (*NonSpurReader method*), 49  
 iswords() (*SpurReader method*), 50

## J

jit\_driver (*Interpreter attribute*), 42  
 JitIface (*class in rsqueakvm.plugins.vmdebugging.hooks*), 26  
 jitted\_check\_for\_interrupt() (*Interpreter method*), 42

## K

keep\_op() (*Trace method*), 35  
 key() (*AssociationWrapper method*), 65

## L

LargeIntegers (*class in rsqueakvm.plugins.large\_integers*), 28  
 last\_link() (*LinkedListWrapper method*), 66  
 leave\_virtual\_frame() (*ContextPartShadow method*), 62  
 len\_and\_header() (*SpurImageWriter method*), 49  
 len\_bytes() (*GenericObject method*), 48  
 len\_bytes\_of() (*BaseReaderStrategy method*), 47  
 length() (*Stream method*), 37  
 LinkedListWrapper (*class in rsqueakvm.wrapper*), 66  
 LinkWrapper (*class in rsqueakvm.wrapper*), 66  
 ListEntry (*class in rsqueakvm.storage*), 54  
 ListStrategy (*class in rsqueakvm.storage*), 54  
 literal\_count\_of\_method\_header() (*NonSpurReader method*), 49  
 literal\_count\_of\_method\_header() (*SpurReader method*), 50  
 literalat0() (*W\_CompiledMethod method*), 12  
 literalatput0() (*W\_CompiledMethod method*), 12  
 load() (*Shell method*), 36  
 LocalePlugin (*class in rsqueakvm.plugins.locale\_plugin*), 28  
 LocalReturn, 42  
 lock() (*SDLDisplay method*), 40  
 log() (*BaseReaderStrategy method*), 47  
 log() (*StrategyFactory method*), 57

- LogFile (class in *rsqueakvm.plugins.profiler\_plugin*), 29
- longJumpIfFalseBytecode() (ContextPartShadow method), 62
- longJumpIfTrueBytecode() (ContextPartShadow method), 62
- longUnconditionalJumpBytecode() (ContextPartShadow method), 62
- lookup() (ClassShadow method), 58
- lookup\_class(W\_CompiledMethod attribute), 12
- lookup\_in\_assocs\_g() (BaseReaderStrategy method), 47
- lookup\_selector(W\_CompiledMethod attribute), 12
- loop() (Interpreter method), 42
- loop\_bytecodes() (Interpreter method), 42
- ## M
- major\_class\_index\_of() (SpurReader method), 50
- make() (LocalReturn static method), 43
- make() (NonLocalReturn static method), 43
- make\_call\_primitive\_bytecode() (in module *rsqueakvm.interpreter\_bytecodes*), 43
- make\_call\_primitive\_bytecode\_classbased() (in module *rsqueakvm.interpreter\_bytecodes*), 43
- make\_func() (in module *rsqueakvm.plugins.large\_integers*), 28
- make\_getter() (in module *rsqueakvm.wrapper*), 67
- make\_getter\_setter() (in module *rsqueakvm.wrapper*), 67
- make\_hook() (in module *rsqueakvm.plugins.vmdebugging.hooks*), 26
- make\_initial\_space() (in module *rsqueakvm.main*), 44
- make\_int\_getter() (in module *rsqueakvm.wrapper*), 67
- make\_int\_getter\_setter() (in module *rsqueakvm.wrapper*), 67
- make\_int\_setter() (in module *rsqueakvm.wrapper*), 68
- make\_pointers\_object() (ClassShadow method), 58
- make\_prim() (in module *rsqueakvm.primitives*), 34
- make\_quick\_call\_primitive\_bytecode() (in module *rsqueakvm.interpreter\_bytecodes*), 44
- make\_send\_selector\_bytecode() (in module *rsqueakvm.interpreter\_bytecodes*), 44
- make\_setter() (in module *rsqueakvm.wrapper*), 68
- make\_simulation() (in module *rsqueakvm.primitives*), 34
- make\_socket() (W\_SocketHandle method), 30
- make\_special\_objects() (ObjSpace method), 45
- make\_w\_assoc() (AssociationWrapper static method), 65
- mark\_returned() (ContextPartShadow method), 62
- MAX\_FIXED\_SLOTS (in module *rsqueakvm.plugins.immutability.pointers*), 24
- method() (Shell method), 36
- method\_from\_greenkey() (in module *rsqueakvm.plugins.vmdebugging.model*), 26
- method\_str() (ContextPartShadow method), 62
- method\_str\_block\_context() (ContextPartShadow method), 62
- method\_str\_method\_context() (ContextPartShadow method), 62
- MethodDictionaryShadow (class in *rsqueakvm.storage\_classes*), 59
- minimum\_bytelen\_for() (in module *rsqueakvm.plugins.large\_integers*), 28
- minor\_class\_index\_of() (SpurReader method), 50
- MiscPrimitivePlugin (class in *rsqueakvm.plugins.misc\_primitive\_plugin*), 29
- MissingBytecode, 41
- mouse\_button() (NullDisplay method), 38
- mouse\_button() (SDLDisplay method), 40
- mouse\_point() (NullDisplay method), 38
- mouse\_point() (SDLDisplay method), 40
- mutate() (W\_BytesObject method), 20
- my\_list() (ProcessWrapper method), 66
- ## N
- name (ClassShadow attribute), 58
- name() (Plugin method), 29
- new() (ClassShadow method), 58
- newClosure() (ObjSpace method), 45
- next() (SQLCursor method), 23
- next() (Stream method), 37
- next\_bytes() (Stream method), 37
- next\_id() (WDBObject static method), 22
- next\_instance() (in module *rsqueakvm.primitives.storage*), 34
- next\_keycode() (NullDisplay method), 38
- next\_keycode() (SDLDisplay method), 40
- next\_link() (LinkWrapper method), 66
- next\_object() (in module *rsqueakvm.primitives.misc*), 34
- next\_qword() (Stream method), 37
- next\_short() (Stream method), 37
- next\_stage() (Progress method), 36
- non\_blocking\_recv() (in module *rsqueakvm.plugins.socket\_plugin*), 31

NonLocalReturn, 43

NonSpurReader (class in *rsqueakvm.squeakimage*), 48

NonVirtualReturn, 43

notify() (*MethodDictionaryShadow* method), 59

NullDisplay (class in *rsqueakvm.display*), 38

num() (*ContextState* method), 65

numArgs() (*W\_BlockClosure* method), 9

## O

ObjSpace (class in *rsqueakvm.objspace*), 45

ObserveeShadow (class in *rsqueakvm.storage*), 55

old\_to\_spur\_specs (*SpurImageWriter* attribute), 49

on\_abort() (*JitIface* method), 26

on\_trace\_too\_long() (*JitIface* method), 26

onesided\_become() (*AbstractGenericShadow* method), 51

onesided\_become() (*AbstractStrategy* method), 52

onesided\_become() (*ContextPartShadow* method), 62

onesided\_become() (*ShadowMixin* method), 55

open() (*LogFile* method), 29

OptimizedConvertFromAllNilMixin (class in *rsqueakvm.storage*), 55

own\_fetch() (*AbstractGenericShadow* method), 51

own\_fetch() (*ContextPartShadow* method), 62

own\_fetch() (*ShadowMixin* method), 55

own\_size() (*AbstractGenericShadow* method), 51

own\_size() (*ContextPartShadow* method), 62

own\_size() (*ShadowMixin* method), 55

own\_store() (*AbstractGenericShadow* method), 51

own\_store() (*ContextPartShadow* method), 62

own\_store() (*ShadowMixin* method), 56

owner() (*CriticalSectionWrapper* method), 65

## P

padding\_for() (*SpurImageWriter* method), 49

parse() (*Trace* method), 35

parse\_args() (*Config* method), 44

parse\_bridges() (*Trace* method), 35

parse\_loop() (*Trace* method), 35

patch() (*Plugin* method), 29

patch() (*ProfilerPlugin* method), 29

patch() (*TailcallPlugin* method), 32

patch\_compiled\_method() (in module *rsqueakvm.plugins.profiler\_plugin*), 30

patch\_interpreter() (in module *rsqueakvm.plugins.profiler\_plugin*), 30

patch\_w\_object() (in module *rsqueakvm.plugins.immutability*), 25

pc() (*ContextPartShadow* method), 62

peek() (*ContextPartShadow* method), 62

peek() (*Stream* method), 37

peek\_bytes() (*Stream* method), 37

peek\_keycode() (*NullDisplay* method), 39

peek\_keycode() (*SDLDisplay* method), 40

peek\_n() (*ContextPartShadow* method), 62

perform() (*Interpreter* method), 42

perform\_headless() (*Interpreter* method), 42

Plugin (class in *rsqueakvm.plugins.plugin*), 29

PluginRegistry (class in *rsqueakvm.plugins*), 33

pointers\_become\_one\_way() (*W\_AbstractObjectWithClassReference* method), 5

pointers\_become\_one\_way() (*W\_BlockClosure* method), 9

pointers\_become\_one\_way() (*W\_CompiledMethod* method), 12

pointers\_become\_one\_way() (*W\_Object* method), 7

pointers\_become\_one\_way() (*W\_PointersObject* method), 19

POINTERS\_CLASS\_ITER (in module *rsqueakvm.plugins.immutability.pointers*), 24

POINTERS\_CLASSES (in module *rsqueakvm.plugins.immutability.pointers*), 24

PointWrapper (class in *rsqueakvm.wrapper*), 66

pop() (*AbstractStrategy* method), 52

pop() (*AllNilStrategy* method), 52

pop() (*CharacterOrNilStrategy* method), 53

pop() (*ContextPartShadow* method), 62

pop() (*FloatOrNilStrategy* method), 54

pop() (*ListStrategy* method), 55

pop() (*SmallIntegerOrNilStrategy* method), 56

pop() (*WeakListStrategy* method), 57

pop\_and\_return\_n() (*ContextPartShadow* method), 62

pop\_n() (*ContextPartShadow* method), 62

popStackBytecode() (*ContextPartShadow* method), 62

post\_become\_one\_way() (*W\_AbstractObjectWithIdentityHash* method), 6

post\_become\_one\_way() (*W\_Object* method), 7

post\_init() (*W\_CompiledMethod* method), 12

prepare\_abort() (*JitIface* method), 26

prepare\_compile\_hook() (*JitIface* method), 26

prepare\_trace\_too\_long() (*JitIface* method), 26

primDigitAdd() (in module *rsqueakvm.plugins.large\_integers*), 28

primDigitCompare() (in module *rsqueakvm.plugins.large\_integers*), 28

primDigitDivNegative() (in module *rsqueakvm.plugins.large\_integers*), 28

primDigitMultiplyNegative() (in module



*rsqueakvm.plugins.large\_integers*), 28  
 primDigitSubtract() (in module *rsqueakvm.plugins.large\_integers*), 28  
 primitive() (*W\_CompiledMethod* method), 12  
 primitive\_fetch() (in module *rsqueakvm.primitives.storage*), 34  
 primitive\_name\_from\_code() (in module *rsqueakvm.primitives*), 34  
 primitive\_store() (in module *rsqueakvm.primitives.storage*), 34  
 primitiveCompareString() (in module *rsqueakvm.plugins.misc\_primitive\_plugin*), 29  
 primitiveCountry() (in module *rsqueakvm.plugins.locale\_plugin*), 28  
 primitiveDirectoryCreate() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 primitiveDirectoryDelete() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 primitiveDirectoryDelimiter() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 primitiveDirectoryLookup() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 primitiveDirectorySetMacTypeAndCreator() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 PrimitiveFailedError, 41  
 primitiveFileAtEnd() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 primitiveFileClose() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 primitiveFileDelete() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 primitiveFileFlush() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 primitiveFileGetPosition() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 primitiveFileOpen() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 primitiveFileRead() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 primitiveFileSetPosition() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 primitiveFileSize() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 primitiveFileStdioHandles() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 primitiveFileTruncate() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 primitiveFileWrite() (in module *rsqueakvm.plugins.file\_plugin*), 27  
 primitiveHasSocketAccess() (in module *rsqueakvm.plugins.socket\_plugin*), 31  
 PrimitiveHolder (class in *rsqueakvm.primitives*), 34  
 primitiveImmutableFrom() (in module *rsqueakvm.plugins.immutability\_plugin*), 27  
 primitiveImmutableFromArgs() (in module *rsqueakvm.plugins.immutability\_plugin*), 28  
 primitiveIndexOfAsciiInString() (in module *rsqueakvm.plugins.misc\_primitive\_plugin*), 29  
 primitiveInitializeNetwork() (in module *rsqueakvm.plugins.socket\_plugin*), 31  
 primitiveIsImmutable() (in module *rsqueakvm.plugins.immutability\_plugin*), 28  
 primitiveIsTailcallContext() (in module *rsqueakvm.plugins.tailcall\_plugin*), 32  
 primitiveLanguage() (in module *rsqueakvm.plugins.locale\_plugin*), 28  
 primitiveMarkTailcallContext() (in module *rsqueakvm.plugins.tailcall\_plugin*), 32  
 PrimitiveNotYetWrittenError, 41  
 primitiveResolverAbortLookup() (in module *rsqueakvm.plugins.socket\_plugin*), 31  
 primitiveResolverAddressLookupResult() (in module *rsqueakvm.plugins.socket\_plugin*), 31  
 primitiveResolverError() (in module *rsqueakvm.plugins.socket\_plugin*), 31  
 primitiveResolverGetAddressInfo() (in module *rsqueakvm.plugins.socket\_plugin*), 31  
 primitiveResolverGetAddressInfoFamily() (in module *rsqueakvm.plugins.socket\_plugin*), 31  
 primitiveResolverGetAddressInfoNext() (in module *rsqueakvm.plugins.socket\_plugin*), 31  
 primitiveResolverGetAddressInfoProtocol() (in module *rsqueakvm.plugins.socket\_plugin*), 31  
 primitiveResolverGetAddressInfoResult() (in module *rsqueakvm.plugins.socket\_plugin*), 31  
 primitiveResolverGetAddressInfoSize() (in module *rsqueakvm.plugins.socket\_plugin*), 31  
 primitiveResolverGetAddressInfoType() (in module *rsqueakvm.plugins.socket\_plugin*), 31  
 primitiveResolverGetNameInfo() (in module *rsqueakvm.plugins.socket\_plugin*), 31  
 primitiveResolverGetNameInfoHostResult() (in module *rsqueakvm.plugins.socket\_plugin*), 31  
 primitiveResolverGetNameInfoHostSize() (in module *rsqueakvm.plugins.socket\_plugin*), 31

31	(in module <i>rsqueakvm.plugins.socket_plugin</i> ),
primitiveResolverGetNameInfoServiceResult()	32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
31	
primitiveResolverGetNameInfoServiceSize()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
31	
primitiveResolverHostNameResult()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 31
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
31	
primitiveResolverHostNameSize()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 31
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
31	
primitiveResolverLocalAddress()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 31
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
31	
primitiveResolverNameLookupResult()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 31
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
31	
primitiveResolverStartAddressLookup()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 31
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
31	
primitiveResolverStartNameLookup()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 31
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
31	
primitiveResolverStatus()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 31
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
31	
primitiveSocketAbortConnection()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 31
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
31	
primitiveSocketAccept3Semaphores()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 31
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
31	
primitiveSocketAddressGetPort()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 31
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
31	
primitiveSocketAddressSetPort()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 31
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
31	
primitiveSocketBindTo()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 31
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
31	
primitiveSocketCloseConnection()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 31
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
31	
primitiveSocketConnectionStatus()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketConnectTo()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 31
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
31	
primitiveSocketConnectToPort()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketCreate3Semaphores()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketDestroy()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketError()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketGetOptions()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketListenOnPortBacklogInterfere()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketListenWithBacklog()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketListenWithOrWithoutBacklog()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketLocalAddress()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketLocalAddressResult()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketLocalAddressSize()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketLocalPort()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketReceiveDataAvailable()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketReceiveDataBufCount()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketReceiveUDPDataBufCount()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketRemoteAddress()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketRemoteAddressResult()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketRemoteAddressSize()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketRemotePort()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketSendDataBufCount()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketSendDone()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketSendUDPDataBufCount()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveSocketSetOptions()	(in module <i>rsqueakvm.plugins.socket_plugin</i> ), 32
(in module <i>rsqueakvm.plugins.socket_plugin</i> ),	
32	
primitiveStringHash()	(in module <i>rsqueakvm.plugins.misc_primitive_plugin</i> ), 29
(in module <i>rsqueakvm.plugins.misc_primitive_plugin</i> ),	
29	
primNormalizeNegative()	(in module <i>rsqueakvm.plugins.large_integers</i> ), 28
(in module <i>rsqueakvm.plugins.large_integers</i> ),	
28	
primNormalizePositive()	(in module <i>rsqueakvm.plugins.large_integers</i> ), 28
(in module <i>rsqueakvm.plugins.large_integers</i> ),	
28	
print_error()	(in module <i>rsqueakvm.main</i> ), 44
(in module <i>rsqueakvm.main</i> ),	
44	
print_padded()	(Interpreter method), 42
(Interpreter method),	
42	
print_padded_stack()	(ContextPartShadow method), 62
(ContextPartShadow method),	
62	
print_plugin_overview()	(in module <i>rsqueakvm.plugins</i> ), 33
(in module <i>rsqueakvm.plugins</i> ),	
33	
print_stack()	(ContextPartShadow method), 62
(ContextPartShadow method),	
62	
print_trace()	(ContextSwitchException method), 41
(ContextSwitchException method),	
41	
print_trace()	(NonVirtualReturn method), 43
(NonVirtualReturn method),	
43	
priority()	(ProcessWrapper method), 67
(ProcessWrapper method),	
67	
priority_list()	(SchedulerWrapper method), 67
(SchedulerWrapper method),	
67	
privileged_block_fields	(ContextPartShadow

*attribute*), 62  
 privileged\_method\_fields (*ContextPartShadow attribute*), 62  
 process\_list() (*SchedulerWrapper method*), 67  
 ProcessSwitch, 43  
 ProcessWrapper (*class in rsqueakvm.wrapper*), 66  
 ProfilerPlugin (*class in rsqueakvm.plugins.profiler\_plugin*), 29  
 Progress (*class in rsqueakvm.util.progress*), 36  
 promote\_if\_neccessary() (*AbstractGenericShadow method*), 51  
 promote\_if\_neccessary() (*AbstractStrategy method*), 52  
 promote\_if\_neccessary() (*ContextPartShadow method*), 62  
 promote\_if\_neccessary() (*ShadowMixin method*), 56  
 PromotingAssociationWrapper (*class in rsqueakvm.wrapper*), 67  
 provides\_getname (*AbstractStrategy attribute*), 52  
 provides\_getname (*ClassShadow attribute*), 58  
 pump\_events() (*SDLDisplay method*), 40  
 pure\_is\_block\_context() (*ContextPartShadow method*), 62  
 push() (*ContextPartShadow method*), 62  
 push\_all() (*ContextPartShadow method*), 63  
 pushActiveContextBytecode() (*ContextPartShadow method*), 62  
 pushClosureCopyCopiedValuesBytecode() (*ContextPartShadow method*), 62  
 pushConstantFalseBytecode() (*ContextPartShadow method*), 62  
 pushConstantMinusOneBytecode() (*ContextPartShadow method*), 62  
 pushConstantNilBytecode() (*ContextPartShadow method*), 62  
 pushConstantOneBytecode() (*ContextPartShadow method*), 62  
 pushConstantTrueBytecode() (*ContextPartShadow method*), 62  
 pushConstantTwoBytecode() (*ContextPartShadow method*), 62  
 pushConstantZeroBytecode() (*ContextPartShadow method*), 62  
 pushLiteralConstantBytecode() (*ContextPartShadow method*), 62  
 pushLiteralVariableBytecode() (*ContextPartShadow method*), 63  
 pushNewArrayBytecode() (*ContextPartShadow method*), 63  
 pushReceiverBytecode() (*ContextPartShadow method*), 63  
 pushReceiverVariableBytecode() (*ContextPartShadow method*), 63

pushRemoteTempLongBytecode() (*ContextPartShadow method*), 63  
 pushTemporaryVariableBytecode() (*ContextPartShadow method*), 63  
 put\_to\_sleep() (*ProcessWrapper method*), 67

## Q

q() (*Shell method*), 36  
 QuasiConstant() (*in module rsqueakvm.util.cells*), 35  
 QuasiConstantCache (*class in rsqueakvm.util.cells*), 35  
 QuasiConstantMixin (*class in rsqueakvm.util.cells*), 35  
 queue\_event() (*SDLDisplay method*), 40  
 quick\_check\_for\_interrupt() (*Interpreter method*), 42

## R

raw\_input() (*Shell method*), 36  
 raw\_next() (*SQLCursor method*), 23  
 read() (*Wrapper method*), 67  
 read\_1wordobjectheader() (*NonSpurReader method*), 49  
 read\_2wordobjectheader() (*NonSpurReader method*), 49  
 read\_3wordobjectheader() (*NonSpurReader method*), 49  
 read\_all() (*ImageReader method*), 48  
 read\_and\_initialize() (*BaseReaderStrategy method*), 47  
 read\_body() (*BaseReaderStrategy method*), 47  
 read\_body() (*NonSpurReader method*), 49  
 read\_body() (*SpurReader method*), 50  
 read\_header() (*ImageReader method*), 48  
 read\_object() (*NonSpurReader method*), 49  
 read\_object() (*SpurReader method*), 51  
 read\_version() (*ImageReader method*), 48  
 record\_damage() (*SDLDisplay method*), 40  
 recv() (*W\_SocketHandle method*), 31  
 rehash() (*W\_AbstractObjectWithIdentityHash method*), 6  
 relinquish\_display() (*W\_DisplayBitmap method*), 13  
 reload() (*Shell method*), 36  
 remove() (*LinkedListWrapper method*), 66  
 remove\_first\_link\_of\_list() (*LinkedListWrapper method*), 66  
 remove\_s\_sender() (*ContextPartShadow method*), 63  
 render() (*NullDisplay method*), 39  
 render() (*SDLDisplay method*), 40  
 repr\_classname (*AbstractCachingShadow attribute*), 51

`repr_classname` (*AbstractStrategy attribute*), 52  
`repr_classname` (*AllNilStrategy attribute*), 52  
`repr_classname` (*CachedObjectShadow attribute*), 53  
`repr_classname` (*CharacterOrNilStrategy attribute*), 53  
`repr_classname` (*ClassShadow attribute*), 58  
`repr_classname` (*ContextPartShadow attribute*), 63  
`repr_classname` (*FloatOrNilStrategy attribute*), 54  
`repr_classname` (*ListStrategy attribute*), 55  
`repr_classname` (*MethodDictionaryShadow attribute*), 59  
`repr_classname` (*ObserveeShadow attribute*), 55  
`repr_classname` (*SimpleStorageStrategy attribute*), 56  
`repr_classname` (*SmallIntegerOrNilStrategy attribute*), 56  
`repr_classname` (*W\_16BitDisplayBitmap attribute*), 13  
`repr_classname` (*W\_32BitDisplayBitmap attribute*), 13  
`repr_classname` (*W\_AbstractObjectWithClassReference attribute*), 5  
`repr_classname` (*W\_AbstractObjectWithIdentityHash attribute*), 6  
`repr_classname` (*W\_BlockClosure attribute*), 9  
`repr_classname` (*W\_BytesObject attribute*), 20  
`repr_classname` (*W\_Character attribute*), 10  
`repr_classname` (*W\_CompiledMethod attribute*), 12  
`repr_classname` (*W\_DBObject attribute*), 22  
`repr_classname` (*W\_DirectDisplayBitmap attribute*), 13  
`repr_classname` (*W\_DisplayBitmap attribute*), 13  
`repr_classname` (*W\_Float attribute*), 15  
`repr_classname` (*W\_LargeInteger attribute*), 15  
`repr_classname` (*W\_LargeIntegerBig attribute*), 16  
`repr_classname` (*W\_LargeIntegerWord attribute*), 16  
`repr_classname` (*W\_MappingDisplayBitmap attribute*), 14  
`repr_classname` (*W\_MutableFloat attribute*), 17  
`repr_classname` (*W\_Object attribute*), 7  
`repr_classname` (*W\_PointersObject attribute*), 19  
`repr_classname` (*W\_SmallInteger attribute*), 17  
`repr_classname` (*W\_SocketHandle attribute*), 31  
`repr_classname` (*W\_WordsObject attribute*), 21  
`repr_classname` (*WeakListStrategy attribute*), 57  
`repr_content` () (*W\_AbstractObjectWithClassReference method*), 5  
`repr_content` () (*W\_DisplayBitmap method*), 14  
`repr_content` () (*W\_Object method*), 7  
`repr_content` () (*W\_PointersObject method*), 19  
`reserve` () (*SpurlImageWriter method*), 49  
`reset` () (*Stream method*), 37  
`reset_count` () (*Stream method*), 37  
`reset_damage` () (*SDLDisplay method*), 40  
`reset_pc` () (*ContextPartShadow method*), 63  
`reset_readline` () (*Shell method*), 36  
`reset_stack` () (*ContextPartShadow method*), 63  
`result_string` () (*in module rsqueakvm.main*), 44  
`resume` () (*ProcessWrapper method*), 67  
`resume_driver` (*Interpreter attribute*), 42  
`resume_get_printable_location` () (*in module rsqueakvm.interpreter*), 43  
Return, 43  
`returnFalseBytecode` () (*ContextPartShadow method*), 63  
ReturnFromTopLevel, 43  
`returnNilBytecode` () (*ContextPartShadow method*), 63  
`returnReceiverBytecode` () (*ContextPartShadow method*), 63  
`returnTopFromBlockBytecode` () (*ContextPartShadow method*), 63  
`returnTopFromMethodBytecode` () (*ContextPartShadow method*), 63  
`returnTrueBytecode` () (*ContextPartShadow method*), 63  
rsqueakvm (*module*), 68  
rsqueakvm.constants (*module*), 38  
rsqueakvm.display (*module*), 38  
rsqueakvm.error (*module*), 40  
rsqueakvm.interpreter (*module*), 41  
rsqueakvm.interpreter\_bytecodes (*module*), 43  
rsqueakvm.interpreter\_debugging (*module*), 44  
rsqueakvm.key\_constants (*module*), 44  
rsqueakvm.main (*module*), 44  
rsqueakvm.model (*module*), 21  
rsqueakvm.model.base (*module*), 5  
rsqueakvm.model.block\_closure (*module*), 8  
rsqueakvm.model.character (*module*), 9  
rsqueakvm.model.compiled\_methods (*module*), 10  
rsqueakvm.model.display (*module*), 13  
rsqueakvm.model.numeric (*module*), 14  
rsqueakvm.model.pointers (*module*), 18  
rsqueakvm.model.variable (*module*), 19  
rsqueakvm.objspace (*module*), 45  
rsqueakvm.plugins (*module*), 33  
rsqueakvm.plugins.database (*module*), 23  
rsqueakvm.plugins.database.model (*module*), 22  
rsqueakvm.plugins.file\_plugin (*module*), 27  
rsqueakvm.plugins.immutability (*module*), 25  
rsqueakvm.plugins.immutability.bytes (*module*), 24



- rsqueakvm.plugins.immutability.pointers (module), 24
  - rsqueakvm.plugins.immutability.words (module), 25
  - rsqueakvm.plugins.immutability\_plugin (module), 27
  - rsqueakvm.plugins.large\_integers (module), 28
  - rsqueakvm.plugins.locale\_plugin (module), 28
  - rsqueakvm.plugins.misc\_primitive\_plugin (module), 29
  - rsqueakvm.plugins.plugin (module), 29
  - rsqueakvm.plugins.profiler\_plugin (module), 29
  - rsqueakvm.plugins.ruby\_plugin (module), 30
  - rsqueakvm.plugins.simulation (module), 30
  - rsqueakvm.plugins.socket\_plugin (module), 30
  - rsqueakvm.plugins.tailcall\_plugin (module), 32
  - rsqueakvm.plugins.vmdebugging (module), 26
  - rsqueakvm.plugins.vmdebugging.hooks (module), 26
  - rsqueakvm.plugins.vmdebugging.model (module), 26
  - rsqueakvm.primitives (module), 34
  - rsqueakvm.primitives.array\_stream (module), 33
  - rsqueakvm.primitives.block\_closure (module), 33
  - rsqueakvm.primitives.constants (module), 33
  - rsqueakvm.primitives.input\_output (module), 33
  - rsqueakvm.primitives.mirror (module), 33
  - rsqueakvm.primitives.misc (module), 34
  - rsqueakvm.primitives.storage (module), 34
  - rsqueakvm.primitives.system (module), 34
  - rsqueakvm.squeakimage (module), 46
  - rsqueakvm.storage (module), 51
  - rsqueakvm.storage\_classes (module), 58
  - rsqueakvm.storage\_contexts (module), 59
  - rsqueakvm.util (module), 38
  - rsqueakvm.util.bitmanipulation (module), 35
  - rsqueakvm.util.cells (module), 35
  - rsqueakvm.util.dialog (module), 35
  - rsqueakvm.util.logparser (module), 35
  - rsqueakvm.util.platform\_calls (module), 36
  - rsqueakvm.util.progress (module), 36
  - rsqueakvm.util.shell (module), 36
  - rsqueakvm.util.stream (module), 37
  - rsqueakvm.util.system (module), 37
  - rsqueakvm.util.version (module), 37
  - rsqueakvm.wrapper (module), 65
  - ruint64\_tobytes () (*SpurImageWriter* method), 49
  - run () (*Shell* method), 36
  - runpack () (in module *rsqueakvm.util.stream*), 37
  - runtime\_setup () (*ObjSpace* method), 45
- ## S
- s\_home () (*ContextPartShadow* method), 63
  - s\_home\_block\_context () (*ContextPartShadow* method), 63
  - s\_home\_method\_context () (*ContextPartShadow* method), 63
  - s\_methoddict () (*ClassShadow* method), 58
  - s\_sender () (*ContextPartShadow* method), 63
  - s\_superclass () (*ClassShadow* method), 58
  - safe\_compiled\_in () (*W\_CompiledMethod* method), 12
  - safe\_entry\_point () (in module *rsqueakvm.main*), 44
  - safe\_getclass () (*W\_AbstractObjectWithClassReference* method), 5
  - safe\_getclass () (*W\_Object* method), 7
  - safe\_getclass () (*W\_PointersObject* method), 19
  - safe\_identifier\_string () (*W\_CompiledMethod* method), 12
  - sanitize () (*Config* method), 44
  - scheduler () (in module *rsqueakvm.wrapper*), 68
  - SchedulerWrapper (class in *rsqueakvm.wrapper*), 67
  - SDLCursorClass (class in *rsqueakvm.display*), 39
  - SDLDisplay (class in *rsqueakvm.display*), 39
  - secondExtendedSendBytecode () (*ContextPartShadow* method), 63
  - select\_immutable\_pointers\_class () (in module *rsqueakvm.plugins.immutability.pointers*), 25
  - select\_sql () (in module *rsqueakvm.plugins.database.model*), 22
  - selector\_string () (*W\_BytesObject* method), 20
  - selector\_string () (*W\_Object* method), 7
  - SemaphoreWrapper (class in *rsqueakvm.wrapper*), 67
  - send () (*W\_SocketHandle* method), 31
  - sendLiteralSelectorBytecode () (*ContextPartShadow* method), 63
  - set () (*QuasiConstantMixin* method), 35
  - set () (*SDLCursorClass* method), 39
  - set\_clipboard\_text () (*NullDisplay* method), 39
  - set\_clipboard\_text () (*SDLDisplay* method), 40
  - set\_column\_type () (*W\_DBObject\_State* method), 22
  - set\_full\_screen () (*NullDisplay* method), 39
  - set\_full\_screen () (*SDLDisplay* method), 40

set\_initial\_strategy() (StrategyFactory method), 57  
 set\_interp() (Shell method), 36  
 set\_interrupt\_key() (NullDisplay method), 39  
 set\_interrupt\_key() (SDLDisplay method), 40  
 set\_last\_lookup() (SocketPlugin method), 30  
 set\_lookup\_class\_and\_name() (W\_CompiledMethod method), 12  
 set\_numArgs() (W\_BlockClosure method), 9  
 set\_observer() (ObserveeShadow method), 55  
 set\_pixelbuffer\_word() (W\_MappingDisplayBitmap method), 14  
 set\_readline() (Shell method), 36  
 set\_stack() (W\_BlockClosure method), 9  
 set\_startpc() (W\_BlockClosure method), 9  
 set\_state() (ContextPartShadow method), 63  
 set\_storage() (AbstractCachingShadow method), 51  
 set\_storage() (AbstractGenericShadow method), 51  
 set\_storage() (AbstractStrategy method), 52  
 set\_storage() (AllNilStrategy method), 53  
 set\_storage() (CachedObjectShadow method), 53  
 set\_storage() (CharacterOrNilStrategy method), 53  
 set\_storage() (ClassShadow method), 58  
 set\_storage() (ContextPartShadow method), 63  
 set\_storage() (FloatOrNilStrategy method), 54  
 set\_storage() (ListStrategy method), 55  
 set\_storage() (MethodDictionaryShadow method), 59  
 set\_storage() (ObserveeShadow method), 55  
 set\_storage() (SimpleStorageStrategy method), 56  
 set\_storage() (SmallIntegerOrNilStrategy method), 56  
 set\_storage() (WeakListStrategy method), 57  
 set\_system\_attribute() (ObjSpace method), 45  
 set\_title() (NullDisplay method), 39  
 set\_title() (SDLDisplay method), 40  
 set\_top() (ContextPartShadow method), 63  
 set\_value() (W\_MutableSmallInteger method), 17  
 set\_video\_mode() (NullDisplay method), 39  
 set\_video\_mode() (SDLDisplay method), 40  
 set\_w\_display() (ObjSpace method), 45  
 set\_w\_interrupt\_semaphore() (ObjSpace method), 45  
 set\_w\_jit\_hook\_receiver() (ObjSpace method), 45  
 set\_w\_jit\_hook\_selector() (ObjSpace method), 45  
 set\_w\_low\_space\_semaphore() (ObjSpace method), 45  
 set\_w\_timerSemaphore() (ObjSpace method), 45  
 setbytes() (W\_BytesObject method), 20  
 setbytes() (W\_CompiledMethod method), 12  
 setbytes() (W\_SpurCompiledMethod method), 12  
 setchar() (W\_AbstractObjectWithIdentityHash method), 6  
 setchar() (W\_BytesObject method), 20  
 setchar() (W\_CompiledMethod method), 12  
 setchar() (W\_SpurCompiledMethod method), 12  
 setchar() (W\_WordsObject method), 21  
 setheader() (W\_CompiledMethod method), 12  
 setheader() (W\_PreSpurCompiledMethod method), 12  
 setheader() (W\_SpurCompiledMethod method), 12  
 setliteral() (W\_CompiledMethod method), 12  
 setliterals() (W\_CompiledMethod method), 12  
 settemp() (ContextPartShadow method), 63  
 settemp\_block\_context() (ContextPartShadow method), 63  
 settemp\_method\_context() (ContextPartShadow method), 63  
 setup() (ImmutabilityPlugin method), 27  
 setup() (Plugin method), 29  
 setup() (ProfilerPlugin method), 29  
 setup() (TailcallPlugin method), 32  
 setup\_notification() (MethodDictionaryShadow method), 59  
 setvalue() (W\_AbstractFloat method), 15  
 setvalue() (W\_Float method), 15  
 setvalue() (W\_MutableFloat method), 17  
 setword() (W\_16BitDisplayBitmap method), 13  
 setword() (W\_DisplayBitmap method), 14  
 setword() (W\_Object method), 7  
 setword() (W\_WordsObject method), 21  
 setwords() (W\_DisplayBitmap method), 14  
 setwords() (W\_WordsObject method), 21  
 ShadowMixin (class in rsqueakvm.storage), 55  
 Shell (class in rsqueakvm.util.shell), 36  
 short\_at0() (W\_BytesObject method), 20  
 short\_at0() (W\_WordsObject method), 21  
 short\_atput0() (W\_BytesObject method), 20  
 short\_atput0() (W\_WordsObject method), 21  
 short\_str() (ContextPartShadow method), 63  
 shortConditionalJumpBytecode() (ContextPartShadow method), 63  
 shortUnconditionalJumpBytecode() (ContextPartShadow method), 63  
 should\_load\_plugin() (in module rsqueakvm.plugins), 33  
 signal() (SemaphoreWrapper method), 67  
 signal\_memory\_error() (Interpreter method), 42  
 SimpleStorageStrategy (class in rsqueakvm.storage), 56  
 simulate() (SimulationPlugin method), 30  
 SimulatedPrimitiveFailedError, 41  
 simulateNumeric() (SimulationPlugin method), 30

SimulationPlugin (class *rsqueakvm.plugins.simulation*), 30

singleExtendedSendBytecode() (ContextPartShadow method), 63

singleExtendedSuperBytecode() (ContextPartShadow method), 63

size (GenericObject attribute), 48

size() (AbstractStrategy method), 52

size() (AllNilStrategy method), 53

size() (CharacterOrNilStrategy method), 53

size() (ContextPartShadow method), 63

size() (FloatOrNilStrategy method), 54

size() (ListStrategy method), 55

size() (SmallIntegerOrNilStrategy method), 56

size() (W\_AbstractFloat method), 15

size() (W\_AbstractImmutable\_PointersObject method), 24

size() (W\_BlockClosure method), 9

size() (W\_BytesObject method), 20

size() (W\_Character method), 10

size() (W\_CompiledMethod method), 12

size() (W\_DisplayBitmap method), 14

size() (W\_Immutable\_PointersObject method), 25

size() (W\_LargeIntegerBig method), 16

size() (W\_LargeIntegerWord method), 16

size() (W\_Object method), 7

size() (W\_PointersObject method), 19

size() (W\_WordsObject method), 21

size() (WeakListStrategy method), 57

skip\_to\_body() (BaseReaderStrategy method), 47

skipbytes() (Stream method), 37

skipwords() (Stream method), 37

slice() (AbstractStrategy method), 52

slice() (AllNilStrategy method), 53

slice() (CharacterOrNilStrategy method), 53

slice() (FloatOrNilStrategy method), 54

slice() (ListStrategy method), 55

slice() (SmallIntegerOrNilStrategy method), 56

slice() (WeakListStrategy method), 57

SLOTS\_MASK (SpurReader attribute), 50

SmallIntegerOrNilStrategy (class in *rsqueakvm.storage*), 56

smalltalk\_at() (ObjSpace method), 45

smalltalk\_g\_at() (BaseReaderStrategy method), 47

smalltalk\_timestamp() (in module *rsqueakvm.plugins.file\_plugin*), 27

SmalltalkException, 41

SocketPlugin (class in *rsqueakvm.plugins.socket\_plugin*), 30

space() (W\_PointersObject method), 19

special() (SqueakImage method), 51

special\_g\_object() (BaseReaderStrategy method), 47

special\_g\_object\_safe() (BaseReaderStrategy method), 47

SpurCompiledMethodHeader (class in *rsqueakvm.model.compiled\_methods*), 10

SpurImageWriter (class in *rsqueakvm.squeakimage*), 49

SpurReader (class in *rsqueakvm.squeakimage*), 50

SQLConnection (class in *rsqueakvm.plugins.database*), 23

SQLCursor (class in *rsqueakvm.plugins.database*), 23

SQLITE\_BLOB (CConfig attribute), 23

SQLITE\_DONE (CConfig attribute), 23

SQLITE\_FLOAT (CConfig attribute), 23

SQLITE\_INTEGER (CConfig attribute), 23

SQLITE\_NULL (CConfig attribute), 23

SQLITE\_ROW (CConfig attribute), 23

SQLITE\_TEXT (CConfig attribute), 23

SqueakImage (class in *rsqueakvm.squeakimage*), 51

SqueakInterrupt, 40

stack() (ContextPartShadow method), 63

stack\_frame() (Interpreter method), 42

stack\_get() (ContextPartShadow method), 64

stack\_ptr() (ContextPartShadow method), 64

stack\_put() (ContextPartShadow method), 64

stackdepth() (ContextPartShadow method), 64

stackend() (ContextPartShadow method), 64

StackOverflow, 43

stacksize() (ContextPartShadow method), 64

stackstart() (ContextPartShadow method), 64

stackstart\_block\_context() (ContextPartShadow method), 64

stackstart\_method\_context() (ContextPartShadow method), 64

startpc() (W\_BlockClosure method), 9

startup() (Plugin static method), 29

startup() (SocketPlugin static method), 30

state (WDBObject attribute), 22

Statement (class in *rsqueakvm.plugins.database*), 23

StatementCache (class in *rsqueakvm.plugins.database*), 23

StatementHolder (class in *rsqueakvm.plugins.database*), 24

states (ContextState attribute), 65

step() (Interpreter method), 42

STORAGE\_ATTR\_TEMPLATE (in module *rsqueakvm.plugins.immutability.pointers*), 24

store() (AbstractStrategy method), 52

store() (AllNilStrategy method), 53

store() (CachedObjectShadow method), 53

store() (CharacterOrNilStrategy method), 53

store() (ClassShadow method), 58

store() (ContextPartShadow method), 64

store() (FloatOrNilStrategy method), 54

`store()` (*ListStrategy method*), 55  
`store()` (*MethodDictionaryShadow method*), 59  
`store()` (*ObserveeShadow method*), 55  
`store()` (*SmallIntegerOrNilStrategy method*), 56  
`store()` (*W\_AbstractFloat method*), 15  
`store()` (*W\_BlockClosure method*), 9  
`store()` (*W\_Character method*), 10  
`store()` (*W\_CompiledMethod method*), 12  
`store()` (*W\_DBObject method*), 22  
`store()` (*W\_Float method*), 15  
`store()` (*W\_MutableFloat method*), 17  
`store()` (*W\_Object method*), 8  
`store()` (*W\_PointersObject method*), 19  
`store()` (*WeakListStrategy method*), 58  
`store_active_process()` (*SchedulerWrapper method*), 67  
`store_all()` (*AbstractStrategy method*), 52  
`store_all()` (*AllNilStrategy method*), 53  
`store_all()` (*CharacterOrNilStrategy method*), 53  
`store_all()` (*FloatOrNilStrategy method*), 54  
`store_all()` (*ListStrategy method*), 55  
`store_all()` (*SmallIntegerOrNilStrategy method*), 56  
`store_all()` (*W\_BlockClosure method*), 9  
`store_all()` (*W\_PointersObject method*), 19  
`store_all()` (*WeakListStrategy method*), 58  
`store_bits()` (*FormWrapper method*), 66  
`store_block_context()` (*ContextPartShadow method*), 64  
`store_context_part()` (*ContextPartShadow method*), 64  
`store_depth()` (*FormWrapper method*), 66  
`store_excess_signals()` (*SemaphoreWrapper method*), 67  
`store_expected_argument_count()` (*ContextPartShadow method*), 64  
`store_first_link()` (*LinkedListWrapper method*), 66  
`store_height()` (*FormWrapper method*), 66  
`store_initialip()` (*ContextPartShadow method*), 64  
`store_instances_array()` (*ContextPartShadow method*), 64  
`store_last_link()` (*LinkedListWrapper method*), 66  
`store_method_context()` (*ContextPartShadow method*), 64  
`store_my_list()` (*ProcessWrapper method*), 67  
`store_next_link()` (*LinkWrapper method*), 66  
`store_owner()` (*CriticalSectionWrapper method*), 65  
`store_pc()` (*ContextPartShadow method*), 64  
`store_pre_spur_classformat()` (*ClassShadow method*), 58  
`store_s_methoddict()` (*ClassShadow method*), 58  
`store_s_sender()` (*ContextPartShadow method*), 64  
`store_spur_classformat()` (*ClassShadow method*), 58  
`store_stack_ptr()` (*ContextPartShadow method*), 64  
`store_stackpointer()` (*ContextPartShadow method*), 64  
`store_strategy()` (*W\_PointersObject method*), 19  
`store_suspended_context()` (*ProcessWrapper method*), 67  
`store_unwrap_pc()` (*ContextPartShadow method*), 64  
`store_value()` (*AssociationWrapper method*), 65  
`store_w_home()` (*ContextPartShadow method*), 64  
`store_w_method()` (*ContextPartShadow method*), 64  
`store_w_methoddict()` (*ClassShadow method*), 58  
`store_w_name()` (*ClassShadow method*), 59  
`store_w_receiver()` (*ContextPartShadow method*), 64  
`store_w_superclass()` (*ClassShadow method*), 59  
`store_width()` (*FormWrapper method*), 66  
`store_x()` (*PointWrapper method*), 66  
`store_y()` (*PointWrapper method*), 66  
`storeAndPopReceiverVariableBytecode()` (*ContextPartShadow method*), 64  
`storeAndPopRemoteTempLongBytecode()` (*ContextPartShadow method*), 64  
`storeAndPopTemporaryVariableBytecode()` (*ContextPartShadow method*), 64  
`storeRemoteTempLongBytecode()` (*ContextPartShadow method*), 64  
`str_content()` (*W\_AbstractFloat method*), 15  
`str_content()` (*W\_BytesObject method*), 20  
`str_content()` (*W\_Character method*), 10  
`str_content()` (*W\_CompiledMethod method*), 12  
`str_content()` (*W\_LargeIntegerBig method*), 16  
`str_content()` (*W\_LargeIntegerWord method*), 16  
`str_content()` (*W\_Object method*), 8  
`str_content()` (*W\_SmallInteger method*), 17  
`strategy` (*W\_PointersObject attribute*), 19  
`strategy_factory()` (*AbstractStrategy method*), 52  
`strategy_singleton_instance()` (*StrategyFactory method*), 57  
`strategy_singleton_instance_from_cache()` (*StrategyFactory method*), 57  
`strategy_switched()` (*AbstractStrategy method*), 52  
`strategy_switched()` (*AllNilStrategy method*), 53  
`strategy_switched()` (*CharacterOrNilStrategy method*), 53  
`strategy_switched()` (*FloatOrNilStrategy method*), 54



[strategy\\_switched\(\)](#) (*ListStrategy method*), 55  
[strategy\\_switched\(\)](#) (*SmallIntegerOrNilStrategy method*), 56  
[strategy\\_switched\(\)](#) (*WeakListStrategy method*), 58  
[strategy\\_type\\_for\(\)](#) (*StrategyFactory method*), 57  
[StrategyFactory](#) (*class in rsqueakvm.storage*), 57  
[Stream](#) (*class in rsqueakvm.util.stream*), 37  
[StrongListEntry](#) (*class in rsqueakvm.storage*), 57  
[superclass\\_changed\(\)](#) (*ClassShadow method*), 59  
[suspend\(\)](#) (*ProcessWrapper method*), 67  
[suspended\\_context\(\)](#) (*ProcessWrapper method*), 67  
[swap\\_pixels\(\)](#) (*W\_16BitDisplayBitmap method*), 13  
[swapped\\_chrs2int\(\)](#) (*in module rsqueakvm.util.stream*), 37  
[swapped\\_chrs2long\(\)](#) (*in module rsqueakvm.util.stream*), 37  
[switch\\_strategy\(\)](#) (*StrategyFactory method*), 57  
[sync\\_method\\_cache\(\)](#) (*MethodDictionaryShadow method*), 59

## T

[tag\\_float](#) (*FloatOrNilStrategy attribute*), 54  
[TailcallPlugin](#) (*class in rsqueakvm.plugins.tailcall\_plugin*), 32  
[take\\_over\\_display\(\)](#) (*FormWrapper method*), 66  
[take\\_over\\_display\(\)](#) (*W\_DisplayBitmap method*), 14  
[take\\_over\\_display\(\)](#) (*W\_MappingDisplayBitmap method*), 14  
[tempsize\(\)](#) (*ContextPartShadow method*), 64  
[tempsize\(\)](#) (*W\_BlockClosure method*), 9  
[tempsize\(\)](#) (*W\_CompiledMethod method*), 12  
[tempsize\\_block\\_context\(\)](#) (*ContextPartShadow method*), 64  
[tempsize\\_method\\_context\(\)](#) (*ContextPartShadow method*), 64  
[test\\_and\\_set\\_owner\(\)](#) (*CriticalSectionWrapper method*), 66  
[time\\_now\(\)](#) (*Interpreter method*), 42  
[top\(\)](#) (*ContextPartShadow method*), 64  
[Trace](#) (*class in rsqueakvm.util.logparser*), 35  
[trace\(\)](#) (*Shell method*), 36  
[trace\\_image\(\)](#) (*SpurImageWriter method*), 49  
[trace\\_pointers\(\)](#) (*W\_BlockClosure method*), 9  
[trace\\_pointers\(\)](#) (*W\_CompiledMethod method*), 12  
[trace\\_pointers\(\)](#) (*W\_Object method*), 8  
[trace\\_pointers\(\)](#) (*W\_PointersObject method*), 19  
[trace\\_until\\_finish\(\)](#) (*SpurImageWriter method*), 49

[transfer\\_to\\_self\\_from\(\)](#) (*ProcessWrapper method*), 67  
[translated\\_or\\_default\(\)](#) (*in module rsqueakvm.primitives.system*), 34  
[translation\\_options\(\)](#) (*in module rsqueakvm.util.system*), 37  
[try\\_read\\_version\(\)](#) (*ImageReader method*), 48  
[type](#) (*ContextSwitchException attribute*), 41  
[type](#) (*ProcessSwitch attribute*), 43  
[type](#) (*StackOverflow attribute*), 43

## U

[UNASSIGNED\\_HASH](#) (*W\_AbstractObjectWithIdentityHash attribute*), 6  
[unknownBytecode\(\)](#) (*ContextPartShadow method*), 64  
[unlock\(\)](#) (*SDLDisplay method*), 40  
[unrolling\\_int](#) (*class in rsqueakvm.interpreter.bytecodes*), 44  
[untranslated\\_cmd\(\)](#) (*in module rsqueakvm.util.shell*), 36  
[unwind\\_context\\_chain\(\)](#) (*Interpreter method*), 42  
[unwind\\_context\\_chain\\_local\(\)](#) (*Interpreter method*), 42  
[unwind\\_primitive\\_simulation\(\)](#) (*Interpreter method*), 42  
[unwrap\(\)](#) (*CharacterOrNilStrategy method*), 54  
[unwrap\(\)](#) (*FloatOrNilStrategy method*), 54  
[unwrap\(\)](#) (*SmallIntegerOrNilStrategy method*), 56  
[unwrap\\_alternatives\(\)](#) (*in module rsqueakvm.primitives*), 34  
[unwrap\\_array\(\)](#) (*ObjSpace method*), 45  
[unwrap\\_array\(\)](#) (*W\_Object method*), 8  
[unwrap\\_array\(\)](#) (*W\_PointersObject method*), 19  
[unwrap\\_char\(\)](#) (*W\_PointersObject method*), 19  
[unwrap\\_char\\_as\\_byte\(\)](#) (*ObjSpace method*), 45  
[unwrap\\_char\\_as\\_byte\(\)](#) (*W\_Character method*), 10  
[unwrap\\_char\\_as\\_byte\(\)](#) (*W\_Object method*), 8  
[unwrap\\_char\\_as\\_byte\(\)](#) (*W\_SmallInteger method*), 17  
[unwrap\\_float\(\)](#) (*ObjSpace method*), 45  
[unwrap\\_float\(\)](#) (*W\_AbstractFloat method*), 15  
[unwrap\\_float\(\)](#) (*W\_LargeIntegerBig method*), 16  
[unwrap\\_float\(\)](#) (*W\_LargeIntegerWord method*), 16  
[unwrap\\_float\(\)](#) (*W\_Object method*), 8  
[unwrap\\_float\(\)](#) (*W\_SmallInteger method*), 18  
[unwrap\\_int\(\)](#) (*ObjSpace method*), 45  
[unwrap\\_int\(\)](#) (*W\_LargeIntegerBig method*), 16  
[unwrap\\_int\(\)](#) (*W\_Object method*), 8  
[unwrap\\_int\(\)](#) (*W\_SmallInteger method*), 18  
[unwrap\\_int64\(\)](#) (*ObjSpace method*), 45  
[unwrap\\_int64\(\)](#) (*W\_BytesObject method*), 20

[unwrap\\_int64\(\) \(W\\_LargeIntegerBig method\), 16](#)  
[unwrap\\_int64\(\) \(W\\_LargeIntegerWord method\), 16](#)  
[unwrap\\_int64\(\) \(W\\_Object method\), 8](#)  
[unwrap\\_int64\(\) \(W\\_SmallInteger method\), 18](#)  
[unwrap\\_long\\_untranslated\(\) \(W\\_BytesObject method\), 20](#)  
[unwrap\\_long\\_untranslated\(\) \(W\\_LargeIntegerBig method\), 16](#)  
[unwrap\\_long\\_untranslated\(\) \(W\\_LargeIntegerWord method\), 17](#)  
[unwrap\\_long\\_untranslated\(\) \(W\\_SmallInteger method\), 18](#)  
[unwrap\\_positive\\_uint\(\) \(ObjSpace method\), 45](#)  
[unwrap\\_rbigint\(\) \(ObjSpace method\), 45](#)  
[unwrap\\_rbigint\(\) \(W\\_BytesObject method\), 20](#)  
[unwrap\\_rbigint\(\) \(W\\_LargeIntegerBig method\), 16](#)  
[unwrap\\_rbigint\(\) \(W\\_LargeIntegerWord method\), 17](#)  
[unwrap\\_rbigint\(\) \(W\\_Object method\), 8](#)  
[unwrap\\_rbigint\(\) \(W\\_SmallInteger method\), 18](#)  
[unwrap\\_store\\_eargc\(\) \(ContextPartShadow method\), 64](#)  
[unwrap\\_store\\_initialip\(\) \(ContextPartShadow method\), 64](#)  
[unwrap\\_store\\_stackpointer\(\) \(ContextPartShadow method\), 64](#)  
[unwrap\\_string\(\) \(ObjSpace method\), 45](#)  
[unwrap\\_string\(\) \(W\\_AbstractFloat method\), 15](#)  
[unwrap\\_string\(\) \(W\\_BytesObject method\), 20](#)  
[unwrap\\_string\(\) \(W\\_DisplayBitmap method\), 14](#)  
[unwrap\\_string\(\) \(W\\_LargeIntegerBig method\), 16](#)  
[unwrap\\_string\(\) \(W\\_LargeIntegerWord method\), 17](#)  
[unwrap\\_string\(\) \(W\\_Object method\), 8](#)  
[unwrap\\_string\(\) \(W\\_WordsObject method\), 21](#)  
[unwrap\\_uint\(\) \(ObjSpace method\), 45](#)  
[unwrap\\_uint\(\) \(W\\_BytesObject method\), 20](#)  
[unwrap\\_uint\(\) \(W\\_LargeIntegerBig method\), 16](#)  
[unwrap\\_uint\(\) \(W\\_LargeIntegerWord method\), 17](#)  
[unwrap\\_uint\(\) \(W\\_Object method\), 8](#)  
[unwrap\\_uint\(\) \(W\\_SmallInteger method\), 18](#)  
[unwrapped\\_tagged\\_value\(\) \(CharacterOrNilStrategy method\), 54](#)  
[unwrapped\\_tagged\\_value\(\) \(FloatOrNilStrategy method\), 54](#)  
[unwrapped\\_tagged\\_value\(\) \(SmallIntegerOrNilStrategy method\), 56](#)  
[unwrapped\\_wake\\_highest\\_priority\\_process\(\) \(in module rsqueakvm.wrapper\), 68](#)  
[UnwrappingError, 41](#)  
[update\(\) \(Progress method\), 36](#)  
[update\\_compiledin\\_class\\_from\\_literals\(\) \(W\\_CompiledMethod method\), 12](#)  
[update\\_primitive\\_index\(\) \(W\\_SpurCompiledMethod method\), 12](#)  
[update\\_sql\(\) \(in rsqueakvm.plugins.database.model\), 22](#)

## V

[V3CompiledMethodHeader \(class in rsqueakvm.model.compiled\\_methods\), 10](#)  
[value \(W\\_MutableSmallInteger attribute\), 17](#)  
[value \(W\\_SmallInteger attribute\), 18](#)  
[value\(\) \(AllNilStrategy method\), 53](#)  
[value\(\) \(AssociationWrapper method\), 65](#)  
[value\(\) \(IntLocalReturn method\), 42](#)  
[value\(\) \(IntNonLocalReturn method\), 42](#)  
[value\(\) \(PromotingAssociationWrapper method\), 67](#)  
[value\(\) \(Return method\), 43](#)  
[value\(\) \(WrappedLocalReturn method\), 43](#)  
[value\(\) \(WrappedNonLocalReturn method\), 43](#)  
[varsize\(\) \(W\\_BlockClosure method\), 9](#)  
[varsize\(\) \(W\\_Object method\), 8](#)  
[VarsizedWrapper \(class in rsqueakvm.wrapper\), 67](#)  
[version \(AbstractCachingShadow attribute\), 51](#)  
[Version \(class in rsqueakvm.util.version\), 37](#)  
[version \(VersionMixin attribute\), 37](#)  
[version \(W\\_BlockClosure attribute\), 9](#)  
[VersionMixin \(class in rsqueakvm.util.version\), 37](#)

## W

[W\\_16BitDisplayBitmap \(class in rsqueakvm.model.display\), 13](#)  
[W\\_32BitDisplayBitmap \(class in rsqueakvm.model.display\), 13](#)  
[W\\_AbstractFloat \(class in rsqueakvm.model.numeric\), 14](#)  
[W\\_AbstractImmutablePointersObject \(class in rsqueakvm.plugins.immutability.pointers\), 24](#)  
[W\\_AbstractObjectWithClassReference \(class in rsqueakvm.model.base\), 5](#)  
[W\\_AbstractObjectWithIdentityHash \(class in rsqueakvm.model.base\), 5](#)  
[w\\_arguments\(\) \(ContextPartShadow method\), 65](#)  
[w\\_arguments\\_block\\_context\(\) \(ContextPartShadow method\), 65](#)  
[w\\_arguments\\_method\\_context\(\) \(ContextPartShadow method\), 65](#)  
[W\\_BlockClosure \(class in rsqueakvm.model.block\\_closure\), 8](#)  
[W\\_BytesObject \(class in rsqueakvm.model.variable\), 19](#)  
[W\\_Character \(class in rsqueakvm.model.character\), 9](#)  
[w\\_class \(W\\_AbstractObjectWithClassReference attribute\), 5](#)

W\_CompiledMethod (class *rsqueakvm.model.compiled\_methods*), 11  
 WDBObject (class *rsqueakvm.plugins.database.model*), 22  
 WDBObject\_State (class *rsqueakvm.plugins.database.model*), 22  
 W\_DirectDisplayBitmap (class *rsqueakvm.model.display*), 13  
 w\_display() (*ObjSpace method*), 45  
 W\_DisplayBitmap (class *rsqueakvm.model.display*), 13  
 W\_Float (class in *rsqueakvm.model.numeric*), 15  
 W\_Immutable\_BytesObject (class *rsqueakvm.plugins.immutability.bytes*), 24  
 W\_Immutable\_PointersObject (class *rsqueakvm.plugins.immutability.pointers*), 24  
 W\_Immutable\_WordsObject (class *rsqueakvm.plugins.immutability.words*), 25  
 w\_interrupt\_semaphore() (*ObjSpace method*), 45  
 w\_jit\_hook\_receiver() (*ObjSpace method*), 45  
 w\_jit\_hook\_selector() (*ObjSpace method*), 45  
 W\_LargeInteger (class *rsqueakvm.model.numeric*), 15  
 W\_LargeIntegerBig (class *rsqueakvm.model.numeric*), 15  
 W\_LargeIntegerWord (class *rsqueakvm.model.numeric*), 16  
 w\_low\_space\_semaphore() (*ObjSpace method*), 45  
 W\_MappingDisplayBitmap (class *rsqueakvm.model.display*), 14  
 w\_method() (*ContextPartShadow method*), 65  
 w\_method() (*W\_BlockClosure method*), 9  
 w\_method\_block\_context() (*ContextPartShadow method*), 65  
 w\_method\_method\_context() (*ContextPartShadow method*), 65  
 w\_methoddict() (*ClassShadow method*), 59  
 W\_MutableFloat (class *rsqueakvm.model.numeric*), 17  
 W\_MutableSmallInteger (class *rsqueakvm.model.numeric*), 17  
 W\_Object (class in *rsqueakvm.model.base*), 6  
 w\_outerContext() (*W\_BlockClosure method*), 9  
 W\_PointersObject (class *rsqueakvm.model.pointers*), 18  
 W\_PreSpurCompiledMethod (class *rsqueakvm.model.compiled\_methods*), 12  
 w\_receiver() (*ContextPartShadow method*), 65  
 w\_receiver() (*W\_BlockClosure method*), 9  
 w\_receiver\_block\_context() (*ContextPartShadow method*), 65  
 in w\_receiver\_method\_context() (*ContextPartShadow method*), 65  
 in w\_self() (*AbstractGenericShadow method*), 51  
 w\_self() (*ContextPartShadow method*), 65  
 in w\_self() (*ShadowMixin method*), 56  
 w\_sender() (*ContextPartShadow method*), 65  
 in W\_SmallInteger (class *rsqueakvm.model.numeric*), 17  
 W\_SocketHandle (class *rsqueakvm.plugins.socket\_plugin*), 30  
 W\_SpurCompiledMethod (class *rsqueakvm.model.compiled\_methods*), 12  
 in w\_timerSemaphore() (*ObjSpace method*), 46  
 w\_values() (*MethodDictionaryShadow method*), 59  
 in W\_WordsObject (class in *rsqueakvm.model.variable*), 20  
 wait() (*SemaphoreWrapper method*), 67  
 in wake\_highest\_priority\_process() (*SchedulerWrapper method*), 67  
 WeakListEntry (class in *rsqueakvm.storage*), 57  
 WeakListStrategy (class in *rsqueakvm.storage*), 57  
 width() (*FormWrapper method*), 66  
 window\_title() (*ObjSpace method*), 46  
 in word\_from\_pixel() (*W\_MappingDisplayBitmap method*), 14  
 in word\_size (*SpurImageWriter attribute*), 50  
 words\_for() (*SpurReader method*), 51  
 in wrap() (*CharacterOrNilStrategy method*), 54  
 wrap() (*FloatOrNilStrategy method*), 54  
 wrap() (*SmallIntegerOrNilStrategy method*), 56  
 wrap\_bool() (*ObjSpace method*), 46  
 in wrap\_char() (*ObjSpace method*), 46  
 wrap\_debug\_info() (in module *rsqueakvm.plugins.vdebugging.model*), 26  
 wrap\_eargc() (*ContextPartShadow method*), 65  
 wrap\_float() (*ObjSpace method*), 46  
 wrap\_greenkey() (in module *rsqueakvm.plugins.vdebugging.model*), 26  
 in wrap\_initialip() (*ContextPartShadow method*), 65  
 in wrap\_int() (*ObjSpace method*), 46  
 wrap\_list() (*ObjSpace method*), 46  
 wrap\_list\_unroll\_safe() (*ObjSpace method*), 46  
 in wrap\_oplist() (in module *rsqueakvm.plugins.vdebugging.model*), 26  
 in wrap\_pc() (*ContextPartShadow method*), 65  
 wrap\_primitive() (in module *rsqueakvm.primitives*), 34  
 wrap\_rbigint() (*ObjSpace method*), 46  
 wrap\_rbigint\_direct() (*ObjSpace method*), 46

[wrap\\_smallint\\_unsafe\(\)](#) (*ObjSpace method*), [46](#)  
[wrap\\_stackpointer\(\)](#) (*ContextPartShadow method*), [65](#)  
[wrap\\_string\(\)](#) (*ObjSpace method*), [46](#)  
[wrap\\_symbol\(\)](#) (*ObjSpace method*), [46](#)  
[wrap\\_wordint\\_direct\(\)](#) (*ObjSpace method*), [46](#)  
[wrapped\\_compiled\\_hook\(\)](#) (*JitIface method*), [26](#)  
[wrapped\\_tagged\\_value\(\)](#) (*CharacterOrNilStrategy method*), [54](#)  
[wrapped\\_tagged\\_value\(\)](#) (*FloatOrNilStrategy method*), [54](#)  
[wrapped\\_tagged\\_value\(\)](#) (*SmallIntegerOrNilStrategy method*), [57](#)  
[WrappedLocalReturn](#), [43](#)  
[WrappedNonLocalReturn](#), [43](#)  
[WrappedOp\(\)](#) (*in module rsqueakvm.plugins.vmdebugging.model*), [26](#)  
[Wrapper](#) (*class in rsqueakvm.wrapper*), [67](#)  
[WrapperException](#), [41](#)  
[WrappingError](#), [41](#)  
[write\(\)](#) (*Wrapper method*), [67](#)  
[write\\_and\\_trace\(\)](#) (*SpurImageWriter method*), [50](#)  
[write\\_bytes\\_object\(\)](#) (*SpurImageWriter method*), [50](#)  
[write\\_compiled\\_method\(\)](#) (*SpurImageWriter method*), [50](#)  
[write\\_file\\_header\(\)](#) (*SpurImageWriter method*), [50](#)  
[write\\_header\(\)](#) (*SpurImageWriter method*), [50](#)  
[write\\_last\\_bridge\(\)](#) (*SpurImageWriter method*), [50](#)  
[WRITE\\_OPERATIONS](#) (*in module rsqueakvm.plugins.immutability*), [25](#)  
[write\\_pointers\\_object\(\)](#) (*SpurImageWriter method*), [50](#)  
[write\\_word\(\)](#) (*SpurImageWriter method*), [50](#)  
[write\\_words\\_object\(\)](#) (*SpurImageWriter method*), [50](#)

## X

[x\(\)](#) (*PointWrapper method*), [66](#)

## Y

[y\(\)](#) (*PointWrapper method*), [66](#)  
[yield\\_\(\)](#) (*ProcessWrapper method*), [67](#)