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Red Hat Enterprise Linux Release 9.2 Manual Pages on 'python3.9.1' command

\$ man python3.9.1

PYTHON(1) General Commands Manual PYTHON(1)

NAME

python - an interpreted, interactive, object-oriented programming language

SYNOPSIS

```
python [ -B ] [ -b ] [ -d ] [ -E ] [ -h ] [ -i ] [ -l ]
        [ -m module-name ] [ -q ] [ -O ] [ -OO ] [ -s ] [ -S ] [ -u ]
        [ -v ] [ -V ] [ -W argument ] [ -x ] [ [ -X option ] -? ]
        [ --check-hash-based-pycs default | always | never ]
        [ -c command | script | - ] [ arguments ]
```

DESCRIPTION

Python is an interpreted, interactive, object-oriented programming language that combines remarkable power with very clear syntax. For an introduction to programming in Python, see the Python Tutorial. The Python Library Reference documents built-in and standard types, constants, functions and modules. Finally, the Python Reference Manual describes the syntax and semantics of the core language in (perhaps too) much detail. (These documents may be located via the INTERNET REFERENCES below; they may be installed on your system as well.)

Python's basic power can be extended with your own modules written in C or C++. On most systems such modules may be dynamically loaded. Python is also adaptable as an extension language for existing applications. See the internal documentation for hints.

Documentation for installed Python modules and packages can be viewed by running the pydoc program.

COMMAND LINE OPTIONS

- B Don't write .pyc files on import. See also PYTHONDONTWRITEBYTE? CODE.
- b Issue warnings about str(bytes_instance), str(bytearray_instance) and comparing bytes/bytearray with str. (-bb: issue errors)
- c command
Specify the command to execute (see next section). This terminates the option list (following options are passed as arguments to the command).
- check-hash-based-pycs mode
Configure how Python evaluates the up-to-dateness of hash-based .pyc files.
- d Turn on parser debugging output (for expert only, depending on compilation options).
- E Ignore environment variables like PYTHONPATH and PYTHONHOME that modify the behavior of the interpreter.
- h , -? , --help
Prints the usage for the interpreter executable and exits.
- i When a script is passed as first argument or the -c option is used, enter interactive mode after executing the script or the command. It does not read the \$PYTHONSTARTUP file. This can be useful to inspect global variables or a stack trace when a script raises an exception.
- I Run Python in isolated mode. This also implies -E and -s. In isolated mode sys.path contains neither the script's directory nor the user's site-packages directory. All PYTHON* environment variables are ignored, too. Further restrictions may be imposed to prevent the user from injecting malicious code.
- m module-name
Searches sys.path for the named module and runs the corresponding

ing .py file as a script.

- O Remove assert statements and any code conditional on the value of `__debug__`; augment the filename for compiled (bytecode) files by adding `.opt-1` before the `.pyc` extension.
- OO Do -O and also discard docstrings; change the filename for compiled (bytecode) files by adding `.opt-2` before the `.pyc` extension.
- q Do not print the version and copyright messages. These messages are also suppressed in non-interactive mode.
- s Don't add user site directory to `sys.path`.
- S Disable the import of the module `site` and the site-dependent manipulations of `sys.path` that it entails. Also disable these manipulations if `site` is explicitly imported later.
- u Force the `stdout` and `stderr` streams to be unbuffered. This option has no effect on the `stdin` stream.
- v Print a message each time a module is initialized, showing the place (filename or built-in module) from which it is loaded. When given twice, print a message for each file that is checked for when searching for a module. Also provides information on module cleanup at exit.
- V, --version
Prints the Python version number of the executable and exits. When given twice, print more information about the build.
- W argument
Warning control. Python sometimes prints warning message to `sys.stderr`. A typical warning message has the following form:
`file:line: category: message`. By default, each warning is printed once for each source line where it occurs. This option controls how often warnings are printed. Multiple -W options may be given; when a warning matches more than one option, the action for the last matching option is performed. Invalid -W options are ignored (a warning message is printed about invalid options when the first warning is issued). Warnings can also be

controlled from within a Python program using the warnings module.

The simplest form of argument is one of the following action strings (or a unique abbreviation): ignore to ignore all warnings; default to explicitly request the default behavior (printing each warning once per source line); all to print a warning each time it occurs (this may generate many messages if a warning is triggered repeatedly for the same source line, such as inside a loop); module to print each warning only the first time it occurs in each module; once to print each warning only the first time it occurs in the program; or error to raise an exception instead of printing a warning message.

The full form of argument is action:message:category:module:line. Here, action is as explained above but only applies to messages that match the remaining fields. Empty fields match all values; trailing empty fields may be omitted. The message field matches the start of the warning message printed; this match is case-insensitive. The category field matches the warning category. This must be a class name; the match test whether the actual warning category of the message is a subclass of the specified warning category. The full class name must be given. The module field matches the (fully-qualified) module name; this match is case-sensitive. The line field matches the line number, where zero matches all line numbers and is thus equivalent to an omitted line number.

-X option

Set implementation specific option. The following options are available:

- X faulthandler: enable faulthandler

- X showrefcount: output the total reference count and number of used

- memory blocks when the program finishes or after each statement in the

interactive interpreter. This only works on debug builds

-X tracemalloc: start tracing Python memory allocations using the

ing the

tracemalloc module. By default, only the most recent

frame is stored in a

traceback of a trace. Use -X tracemalloc=NFRAME to start

tracing with a

traceback limit of NFRAME frames

-X importtime: show how long each import takes. It shows

module name,

cumulative time (including nested imports) and self time

(excluding

nested imports). Note that its output may be broken in

multi-threaded

application. Typical usage is python3 -X importtime -c

'import asyncio'

-X dev: enable CPython's "development mode", introducing ad?

ditional runtime

checks which are too expensive to be enabled by default.

It will not be

more verbose than the default if the code is correct:

new warnings are

only emitted when an issue is detected. Effect of the

developer mode:

- * Add default warning filter, as -W default

- * Install debug hooks on memory allocators: see the

PyMem_SetupDebugHooks() C function

- * Enable the faulthandler module to dump the Python traceback on a crash

- * Enable asyncio debug mode

- * Set the dev_mode attribute of sys.flags to True

- * io.IOBase destructor logs close() exceptions

-X utf8: enable UTF-8 mode for operating system interfaces,

overriding the default

locale-aware mode. `-X utf8=0` explicitly disables UTF-8

mode (even when it would

otherwise activate automatically). See `PYTHONUTF8` for more details

`-X pycache_prefix=PATH`: enable writing `.pyc` files to a parallel tree rooted at the

given directory instead of to the code tree.

`-x` Skip the first line of the source. This is intended for a DOS specific hack only. Warning: the line numbers in error messages will be off by one!

INTERPRETER INTERFACE

The interpreter interface resembles that of the UNIX shell: when called with standard input connected to a tty device, it prompts for commands and executes them until an EOF is read; when called with a file name argument or with a file as standard input, it reads and executes a script from that file; when called with `-c` command, it executes the Python statement(s) given as command. Here command may contain multiple statements separated by newlines. Leading whitespace is significant in Python statements! In non-interactive mode, the entire input is parsed before it is executed.

If available, the script name and additional arguments thereafter are passed to the script in the Python variable `sys.argv`, which is a list of strings (you must first import `sys` to be able to access it). If no script name is given, `sys.argv[0]` is an empty string; if `-c` is used, `sys.argv[0]` contains the string `'-c'`. Note that options interpreted by the Python interpreter itself are not placed in `sys.argv`.

In interactive mode, the primary prompt is `>>>`; the second prompt (which appears when a command is not complete) is `...!``. The prompts can be changed by assignment to `sys.ps1` or `sys.ps2`. The interpreter quits when it reads an EOF at a prompt. When an unhandled exception occurs, a stack trace is printed and control returns to the primary prompt; in non-interactive mode, the interpreter exits after printing

the stack trace. The interrupt signal raises the KeyboardInterrupt exception; other UNIX signals are not caught (except that SIGPIPE is sometimes ignored, in favor of the IOError exception). Error messages are written to stderr.

FILES AND DIRECTORIES

These are subject to difference depending on local installation conventions; `{prefix}` and `{exec_prefix}` are installation-dependent and should be interpreted as for GNU software; they may be the same. The default for both is `/usr/local`.

`{exec_prefix}/bin/python`

Recommended location of the interpreter.

`{prefix}/lib/python<version>`

`{exec_prefix}/lib/python<version>`

Recommended locations of the directories containing the standard modules.

`{prefix}/include/python<version>`

`{exec_prefix}/include/python<version>`

Recommended locations of the directories containing the include files needed for developing Python extensions and embedding the interpreter.

ENVIRONMENT VARIABLES

PYTHONHOME

Change the location of the standard Python libraries. By default, the libraries are searched in `{prefix}/lib/python<version>` and `{exec_prefix}/lib/python<version>`, where `{prefix}` and `{exec_prefix}` are installation-dependent directories, both defaulting to `/usr/local`. When `$PYTHONHOME` is set to a single directory, its value replaces both `{prefix}` and `{exec_prefix}`.

To specify different values for these, set `$PYTHONHOME` to `{prefix}:{exec_prefix}`.

PYTHONPATH

Augments the default search path for module files. The format is the same as the shell's `$PATH`: one or more directory path?

names separated by colons. Non-existent directories are silently ignored. The default search path is installation dependent, but generally begins with `${prefix}/lib/python<version>` (see `PYTHONHOME` above). The default search path is always appended to `$PYTHONPATH`. If a script argument is given, the directory containing the script is inserted in the path in front of `$PYTHONPATH`. The search path can be manipulated from within a Python program as the variable `sys.path`.

`PYTHONPLATLIBDIR`

Override `sys.platlibdir`.

`PYTHONSTARTUP`

If this is the name of a readable file, the Python commands in that file are executed before the first prompt is displayed in interactive mode. The file is executed in the same name space where interactive commands are executed so that objects defined or imported in it can be used without qualification in the interactive session. You can also change the prompts `sys.ps1` and `sys.ps2` in this file.

`PYTHONOPTIMIZE`

If this is set to a non-empty string it is equivalent to specifying the `-O` option. If set to an integer, it is equivalent to specifying `-O` multiple times.

`PYTHONDEBUG`

If this is set to a non-empty string it is equivalent to specifying the `-d` option. If set to an integer, it is equivalent to specifying `-d` multiple times.

`PYTHONDONTWRITEBYTECODE`

If this is set to a non-empty string it is equivalent to specifying the `-B` option (don't try to write `.pyc` files).

`PYTHONINSPECT`

If this is set to a non-empty string it is equivalent to specifying the `-i` option.

`PYTHONIOENCODING`

If this is set before running the interpreter, it overrides the encoding used for stdin/stdout/stderr, in the syntax encoding? name:errorhandler The errorhandler part is optional and has the same meaning as in str.encode. For stderr, the errorhandler part is ignored; the handler will always be ?backslashreplace?.

PYTHONNOUSERSITE

If this is set to a non-empty string it is equivalent to specifying the -s option (Don't add the user site directory to sys.path).

PYTHONUNBUFFERED

If this is set to a non-empty string it is equivalent to specifying the -u option.

PYTHONVERBOSE

If this is set to a non-empty string it is equivalent to specifying the -v option. If set to an integer, it is equivalent to specifying -v multiple times.

PYTHONWARNINGS

If this is set to a comma-separated string it is equivalent to specifying the -W option for each separate value.

PYTHONHASHSEED

If this variable is set to "random", a random value is used to seed the hashes of str and bytes objects.

If PYTHONHASHSEED is set to an integer value, it is used as a fixed seed for generating the hash() of the types covered by the hash randomization. Its purpose is to allow repeatable hashing, such as for selftests for the interpreter itself, or to allow a cluster of python processes to share hash values.

The integer must be a decimal number in the range [0,4294967295]. Specifying the value 0 will disable hash randomization.

PYTHONMALLOC

Set the Python memory allocators and/or install debug hooks. The available memory allocators are malloc and pymalloc. The avail?

able debug hooks are `debug`, `malloc_debug`, and `pymalloc_debug`.

When Python is compiled in debug mode, the default is `pymalloc_debug` and the debug hooks are automatically used. Otherwise, the default is `pymalloc`.

PYTHONMALLOCSTATS

If set to a non-empty string, Python will print statistics of the `pymalloc` memory allocator every time a new `pymalloc` object arena is created, and on shutdown.

This variable is ignored if the `$PYTHONMALLOC` environment variable is used to force the `malloc(3)` allocator of the C library, or if Python is configured without `pymalloc` support.

PYTHONASYNCIODEBUG

If this environment variable is set to a non-empty string, enable the debug mode of the `asyncio` module.

PYTHONTRACEMALLOC

If this environment variable is set to a non-empty string, start tracing Python memory allocations using the `tracemalloc` module.

The value of the variable is the maximum number of frames stored in a traceback of a trace. For example, `PYTHONTRACEMALLOC=1` stores only the most recent frame.

PYTHONFAULTHANDLER

If this environment variable is set to a non-empty string, `faulthandler.enable()` is called at startup: install a handler for `SIGSEGV`, `SIGFPE`, `SIGABRT`, `SIGBUS` and `SIGILL` signals to dump the Python traceback.

This is equivalent to the `-X faulthandler` option.

PYTHONEXECUTABLE

If this environment variable is set, `sys.argv[0]` will be set to its value instead of the value got through the C runtime. Only works on Mac OS X.

PYTHONUSERBASE

Defines the user base directory, which is used to compute the path of the user site-packages directory and `Distutils` installa?

tion paths for python setup.py install --user.

PYTHONPROFILEIMPORTTIME

If this environment variable is set to a non-empty string, Python will show how long each import takes. This is exactly equivalent to setting -X importtime on the command line.

PYTHONBREAKPOINT

If this environment variable is set to 0, it disables the default fault debugger. It can be set to the callable of your debugger of choice.

Debug-mode variables

Setting these variables only has an effect in a debug build of Python, that is, if Python was configured with the --with-pydebug build option.

PYTHONTHREADDEBUG

If this environment variable is set, Python will print threading debug info.

PYTHONDUMPREFS

If this environment variable is set, Python will dump objects and reference counts still alive after shutting down the interpreter.

AUTHOR

The Python Software Foundation: <https://www.python.org/psf/>

INTERNET RESOURCES

Main website: <https://www.python.org/>

Documentation: <https://docs.python.org/>

Developer resources: <https://devguide.python.org/>

Downloads: <https://www.python.org/downloads/>

Module repository: <https://pypi.org/>

Newsgroups: comp.lang.python, comp.lang.python.announce

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