

# Judgement Details

## Judge System

The bottom line is that we have the same computers as yours to run your programs in the judge room. The judge system, however, will run them inside a *sandboxed environment*, i.e. with protections to prevent the system damaged. Specifically:

- Memory usage is limited to 2 GB in the environment. Note it is the total amount, not the amount you can use exclusively in your programs.
- The stack size is set unlimited (in C/C++), only capped by the total memory limit.
- Multi-processing or multi-threading is discouraged and unlikely beneficial, though not prohibited. Remember your programs will run on a single core of processor. The total number of processes is limited to 15, including ones the system may create outside your programs.
- It is *never* recommended to run external commands.<sup>1</sup> It is technically possible but probably does not work as you expect.
- Python module installations may be different from those in your computer (see also: “Note to Python Users”).

If you have no idea about what these mean — no worries. Just remember your programs should use the standard input and output, not files. Everything else should be unrelated to you.

There are a couple more restrictions that apply:

- The total amount of source code must not exceed 256 KB in each submission.
- Your program must compile within 30 seconds.

See the DOMjudge team manual for more details about these restrictions.

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<sup>1</sup> e.g. using `execve()` or `system()` in C/C++; `ProcessBuilder` or `Runtime.exec()` in Java.

## Compile Options

Your source file(s) will be compiled and run as follows. "\$@" denotes your source file(s); "\$DEST" is the name of binary (which is "./a.out" by default) and is chosen arbitrarily by the system.

<b>C</b>	
Compile	<code>gcc -x c -g -O2 -std=gnu11 -static -o "\$DEST" "\$@" -lm</code>
Run	<code>"\$DEST" &lt; <u>infile</u> &gt; <u>outfile</u></code>
<b>C++</b>	
Compile	<code>g++ -x cpp -g -O2 -std=gnu++11 -static -o "\$DEST" "\$@"</code>
Run	<code>"\$DEST" &lt; <u>infile</u> &gt; <u>outfile</u></code>
<b>Java</b>	
Compile	<code>javac -encoding UTF-8 -sourcepath . -d . "\$@"</code>
Run <sup>2</sup>	<code>java -XX:+UseSerialGC -Xss64m -Xmx1920m -Xms1920m <u>MainClass</u> \ &lt; <u>infile</u> &gt; <u>outfile</u></code>
<b>Python 2 (PyPy)</b>	
Compile <sup>3</sup>	<code>python2 -m py_compile "\$@"</code>
Run	<code>pypy "\$@" &lt; <u>infile</u> &gt; <u>outfile</u></code>
<b>Python 3</b>	
Compile <sup>3</sup>	<code>python3 -m py_compile "\$@"</code>
Run	<code>python3 "\$@" &lt; <u>infile</u> &gt; <u>outfile</u></code>

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<sup>2</sup> DOMjudge will detect the main class automatically; you do not have to name it `Main`. See the DOMjudge team manual for details.

<sup>3</sup> Python's "Compile" commands are executed only to check the syntax. Generated \*.pyc files will *not* be used in the real run.

## Submission Results

Your submissions will eventually be responded with one of the following results:

### Accepted

- **CORRECT** — Your program ran successfully and passed all test cases.

### Rejected with 20-minute penalty

- **WRONG-ANSWER** — Your program neither crashed nor exceeded the time limit, but produced incorrect output for some test case(s).
- **NO-OUTPUT** — Your program did not produce any output for some test case(s).
- **TIMELIMIT** — Your program did not finish within the time limit for some test case.
- **RUN-ERROR** — Your program crashed with some test case, or otherwise exited with a non-zero exit status (e.g. because of missing “`return 0;`” in C/C++).

### Rejected with no penalty

- **COMPILE-ERROR** — Your program did not compile on the judging environment. You can consult error message(s) on the submission details page.
- **TOO-LATE** — Your program was submitted after the contest was over.<sup>4</sup>

## Note to Python Users

The judges have solved all problems in C++ and Java, but not necessarily in Python. They do not guarantee that all problems can be solved in Python.

Only syntax errors will be reported as **COMPILE-ERROR**. Other types of errors, such as `NameError` or `ModuleNotFoundError`, will result in **RUN-ERROR** (incurring 20-minute penalty).

The full list of modules available in the judge system can be found in the following pages. Note it may differ from that you would find on your workstation.

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<sup>4</sup> Note it does not mean your programs need to be *judged* before the end of contest. Your programs will be judged as long as submitted (“*queued*”) within the contest time.

## Available Modules in Python 2

BaseHTTPServer	_resource_cffi	formatter	quopri
Bastion	_scproxy	fpformat	random
CDROM	_sha	fractions	re
CGIHTTPServer	_sha256	ftplib	readline
Canvas	_sha512	functools	repr
ConfigParser	_socket	future_builtins	resource
Cookie	_sqlite3	gc	rexec
DLFCN	_sqlite3_build	gdbm	rfc822
DLFCN_default	_sqlite3_cffi	genericpath	rlcompleter
DLFCN_mips	_sre	getopt	robotparser
Dialog	_ssl	getpass	runpy
DocXMLRPCServer	_strptime	gettext	sched
FileDialog	_struct	glob	select
FixTk	_structseq	greenlet	sets
HTMLParser	_subprocess	grp	sgmllib
IN	_sysconfigdata	gzip	sha
IN_alpha	_syslog_build	hashlib	shelve
IN_default	_syslog_cffi	heapq	shlex
IN_hppa	_testcapi	hmac	shutil
IN_mips	_testing	hotshot	signal
IN_sparc	_threading_local	htmlentitydefs	site
MimeWriter	_vmprof	htmllib	smtplib
Queue	_warnings	httplib	smtplib
ScrolledText	_weakref	identity_dict	sndhdr
SimpleDialog	_weakrefset	idlelib	socket
SimpleHTTPServer	abc	ihooks	sqlite3
SimpleXMLRPCServer	aifc	imaplib	sre
SocketServer	antigravity	imgchr	sre_compile
StringIO	anydbm	imp	sre_constants
TYPES	argparse	importlib	sre_parse
Tix	array	imputil	ssl
Tkconstants	ast	inspect	stackless
Tkdnd	asynchat	io	stat
Tkinter	asyncore	itertools	statvfs
UserDict	atexit	json	string
UserList	audiodev	keyword	stringold
UserString	audioop	lib2to3	stringprep
_LWPCookieJar	base64	linecache	struct
_MozillaCookieJar	bdb	locale	subprocess
__builtin__	binascii	logging	sunau
__future__	binhex	macpath	sunaudio
__pypy__	bisect	macurl2path	symbol
_abcoll	bsddb	mailbox	symtable
_ast	bz2	mailcap	sys
_audioop_build	cPickle	markupbase	sysconfig
_audioop_cffi	cProfile	marshal	syslog
_cffi_backend	cStringIO	math	tabnanny
_codecs	calendar	md5	tarfile
_codecs_cn	cffi	mhlib	telnetlib
_codecs_hk	cgi	mimetypes	tempfile
_codecs_iso2022	cgilib	mimify	termios
_codecs_jp	chunk	mmap	test
_codecs_kr	cmath	modulefinder	textwrap
_codecs_tw	cmd		this

_collections	code	msilib	thread
_continuation	codecs	msvcrt	threading
_csv	codeop	multifile	time
_ctypes	collections	multiprocessing	timeit
_ctypes_test	colorsys	mutex	tkColorChooser
_curses	commands	netrc	tkCommonDialog
_curses_build	compileall	new	tkFileDialog
_curses_cffi	compiler	nntplib	tkFont
_curses_panel	contextlib	ntpath	tkMessageBox
_elementtree	cookielib	nturl2path	tkSimpleDialog
_ffi	copy	numbers	toaiff
_file	copy_reg	opcode	token
_functools	cppy	operator	tokenize
_gdbm_build	cpyext	optparse	tputil
_gdbm_cffi	crypt	os	trace
_hashlib	csv	os2emxpath	traceback
_io	ctypes	parser	ttk
_jitlog	ctypes_support	pdb	tty
_locale	curses	pickle	turtle
_lsprof	datetime	pickletools	types
_marshal	dbhash	pipes	unicodedata
_md5	dbm	pkgutil	unittest
_minimal_curses	decimal	platform	urllib
_multibytecodec	difflib	plistlib	urllib2
_multiprocessing	dircache	popen2	urlparse
_numpy	dis	poplib	user
_osx_support	distutils	posix	uu
_pickle_support	doctest	posixfile	uuid
_pwdgrp_build	dumbdbm	posixpath	warnings
_pwdgrp_cffi	dummy_thread	pprint	wave
_pyio	dummy_threading	profile	weakref
_pypy_interact	email	pstats	webbrowser
_pypy_irc_topic	encodings	pty	whichdb
_pypy_testcapi	ensurepip	pwd	wsgiref
_pypy_wait	errno	py_compile	xdrlib
_pypy_winbase_build	exceptions	pyclbr	xml
_pypy_winbase_cffi	faulthandler	pydoc	xmllib
_pypyjson	fcntl	pydoc_data	xmlrpclib
_random	filecmp	pyexpat	zipfile
_rawffi	fileinput	pypyjit	zipimport
_resource_build	fnmatch	pyrepl	zlib

## Available Modules in Python 3

AptUrl	antigravity	glob	re
CDROM	appopt	gnome_sudoku	readline
CommandNotFound	apport_python_hook	grp	reprlib
Crypto	apt	gzip	requests
DLFCN	apt_inst	hashlib	resource
DistUpgrade	apt_pkg	heapq	rlcompleter
IN	aptdaemon	hmac	runpy
LanguageSelector	aptsources	html	sched
NvidiaDetector	argparse	http	select
Onboard	array	httplib2	selectors
Quirks	ast	idlelib	shelve
TYPES	asynchat	imaplib	shlex
UbuntuDrivers	asyncio	imgchr	shutil
UpdateManager	asyncore	imp	signal
__future__	atexit	importlib	site
_ast	audioop	inspect	sitecustomize
_bisect	base64	io	six
_bootlocale	bdb	ipaddress	smtpd
_bz2	binascii	itertools	smtplib
_codecs	binhex	janitor	sndhdr
_codecs_cn	bisect	json	socket
_codecs_hk	brlapi	keyword	socketserver
_codecs_iso2022	builtins	language_support_pkgs	softwareproperties
_codecs_jp	bz2	lib2to3	speechd
_codecs_kr	cProfile	linecache	speechd_config
_codecs_tw	cairo	locale	spwd
_collections	calendar	logging	sqlite3
_collections_abc	cgi	louis	sre_compile
_compat_pickle	cgitb	lsb_release	sre_constants
_crypt	chardet	lxml	sre_parse
_csv	checkbox_ng	lzma	ssl
_ctypes	checkbox_support	macpath	stat
_ctypes_test	chunk	macurl2path	statistics
_curses	cmath	mailbox	string
_curses_panel	cmd	mailcap	stringprep
_datetime	code	make	struct
_dbm	codecs	markupsafe	subprocess
_dbus_bindings	codeop	marshal	sunau
_dbus_glib_bindings	collections	math	symbol
_dummy_thread	colorsys	mimetypes	symtable
_elementtree	compileall	mmap	sys
_functools	concurrent	modulefinder	sysconfig
_gdbm	configparser	multiprocessing	syslog
_hashlib	contextlib	netrc	tabnanny
_heapq	copy	nis	tarfile
_imp	copyreg	nntplib	telnetlib
_io	crypt	ntpath	tempfile
_json	csv	nturl2path	termios
_locale	ctypes	numbers	test
_lsprof	curl	oauthlib	textwrap
_lzma	curses	opcode	this
_markupbase	datetime	operator	threading
_md5	dbm	optparse	time
_multibytecodec	dbus	orca	timeit

_multiprocessing	deb822	os	tkinter
_opcode	debconf	ossaudiodev	token
_operator	debian	parser	tokenize
_osx_support	debian_bundle	pathlib	trace
_pickle	decimal	pdb	traceback
_posixsubprocess	defer	pickle	tracemalloc
_pyio	difflib	pickletools	tty
_random	dis	pipes	turtle
_sha1	distutils	pkg_resources	types
_sha256	doctest	pkgutil	ufw
_sha512	dummy_threading	plainbox	unicodedata
_sitebuiltins	email	platform	unittest
_socket	encodings	plistlib	urllib
_sqlite3	enum	poplib	urllib3
_sre	errno	posix	usbcreator
_ssl	faulthandler	posixpath	uu
_stat	fcntl	pprint	uuid
_string	feedparser	problem_report	venv
_strptime	feedparser_sgmlib3	profile	warnings
_struct	filecmp	pstats	wave
_symtable	fileinput	pty	weakref
_sysconfigdata	fnmatch	pwd	webbrowser
_sysconfigdata_m	formatter	py_compile	wsgiref
_testbuffer	fpectl	pyatspi	xdg
_testcapi	fractions	pyclbr	xdiagnose
_testimportmultiple	friends	pycurl	xdrlib
_thread	ftplib	pydoc	xkit
_threading_local	functools	pydoc_data	xml
_tracemalloc	gc	pyexpat	xmlrpc
_warnings	genericpath	pygtkcompat	xxlimited
_weakref	getopt	pyparsing	xxsubtype
_weakrefset	getpass	queue	zipfile
abc	gettext	quopri	zipimport
aifc	gi	random	zlib