

eGenix PyRun

One file Python
Runtime

Version 2.0

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1. Introduction

eGenix PyRun™ is our one-file, portable, no-install version of Python, making the distribution of a Python interpreter to run based scripts and applications to Unix based systems as simple as copying a single file.

1.1 Features

- **Small footprint:** only about 11 MB in size for Python 2.x and only around 13 MB for Python 3.x. Can be further compressed down to just 3-4 MB using e.g. upx.
- **Python 2.6, 2.7 and 3.4 Support:** PyRun works with all popular Python versions. We chose the single source approach for achieving this, but had to drop Python 2.5 support as a result.
- **Cross Platform Support:** PyRun runs on the following platforms: Linux, FreeBSD and Mac OS X.
- **Full 64-bit Support:** PyRun can be built on both 32-bit and 64-bit builds on all supported platforms.
- **Highly Portable Codebase:** in addition to the already supported platforms for PyRun, we provide custom porting services for more exotic platforms.
- **Easy Installation:** Simply drop the executable into a directory and start using it. No installers, no packagers and only a minimal set of dependencies needs to be provided.
- **Fully Relocatable:** eGenix PyRun uses relative search paths, so you can easily move the installation around.
- **Compatible with `setuptools`, `easy_install`, `pip`:** Great care was taken to make sure that PyRun can be used with `setuptools` et al.¹
- **Perfect `virtualenv` replacement:** PyRun provides an even better level of isolation from the system installed Python version. Instead of

¹ Please note that `setuptools` and `pip` are *not* designed to be relocatable.

using symlinks and other tricks to create a virtual Python environments, PyRun comes with a complete Python runtime and thus doesn't need to play any tricks.

- **install-pyrun script:** Using the bash script [install-pyrun](#), we make the whole installation process even easier. It automatically downloads and installs the right version for your platform and also take care of adding setuptools and pip to the PyRun installation.
- **Open Source:** PyRun is licensed under the eGenix Public License. This Python-style makes it possible to integrate PyRun into other open-source or commercial products
- **Commerical Support:** eGenix provides commercial support for PyRun, in case you need custom builds, help with the integration or need problem solving support.

1.2 System Requirements

eGenix PyRun integrates a few standard Python extension modules, which rely on system provided third-party libraries to be available on the build system as development versions, and on the target system as binary versions.

1.2.1 Source Installations

eGenix PyRun needs these third party tools to be available on the target machines:

- **OpenSSL** 1.0.0 or later
- **zlib** 1.2 or later
- **SQLite** 3.4 or later
- **bzip2** 1.0 or later

Future versions of PyRun will add more flexibility to the build process to make the requirements more customizable.

If you want to compile PyRun yourself, you will also need the development packages of the above tools, a C compiler and a GNU make compatible make installed.

Please note that the binary versions of these libraries also need to be available on the PyRun installation target systems. Most modern Unix systems have the above libraries installed per default.

1.2.2 Binary Installations

The readily built version of eGenix PyRun we make available on our website were built using these library versions:

- OpenSSL 1.0.1
- zlib 1.2
- SQLite 3.4
- bzip2 1.0

1.3 Installation

Installation of eGenix PyRun can be done in three ways:

- using the bash script [install-pyrun](#) for automatic installation
- downloading and installing a precompiled binary from www.egenix.com, or
- from sources by compiling your own version.

The following sections explain these options.

1.3.1 Windows Installer

eGenix PyRun currently **does not support Windows platforms**.

We will look into making eGenix PyRun compatible with Windows in one of the upcoming releases.

1.3.2 Quick install using install-pyrun

To simplify the installation of eGenix PyRun and make it as easy to use as *virtualenv*, we've created a shell script called **install-pyrun** that you can [download from our server](#). It is also distributed in the source archives of PyRun in the `PyRun/` folder.

After download of the script, you have to make it executable and place it on your path.

Using install-pyrun

With the script, you can automate the whole installation process easily. In order to install the set of eGenix PyRun (together with the Python include files and some extra C extensions from the `stdlib` that are not compiled into PyRun), `setuptools` and `pip` to a new directory `targetdir`, just run the following command:

```
./install-pyrun targetdir
```

This will then download a suitable eGenix PyRun binary distribution for your platform, install `setuptools` and `pip`:

```
$ install-pyrun targetdir
Installing eGenix PyRun ...
Installing local setuptools 2.1 ...
Installing local pip 1.4.1 ...

eGenix PyRun was installed in targetdir

To run eGenix PyRun, use targetdir/bin/pyrun

$ cd targetdir
$ bin/pyrun -c 'print "Hello World!'"
Hello World!
$ bin/pyrun
eGenix PyRun 2.7.6 (release 2.0.0, default, Jun 13 2014, 20:12:35)
[GCC 4.5.1 20101208 [gcc-4_5-branch revision 167585]]
Thank you for using eGenix PyRun. Type "help" or "license" for
details.

>>>
```

1. Introduction

The script comes with a set of options to customize the version, platform, Unicode variant and also allows disabling installation of setuptools and pip as well as permit installation from a local PyRun archive.

Simply run the script with option `-h` to see all options:

```
$ install-pyrun -h

Install eGenix PyRun in a given target directory.

USAGE:
    install-pyrun [options] targetdir

OPTIONS:
  -m or --minimal
      install eGenix PyRun only (no setuptools and pip)
  -l of --log
      log installation to targetdir/pyrun-installation.log
  -q or --quiet
      quiet installation

  --python=2.7
      install PyRun for Python version 2.6, 2.7 (default), 3.4
  --python-unicode=ucs2
      install PyRun for Python Unicode version
      ucs2 (default for Python 2) or
      ucs4 (default for Python 3)
  --pyrun=2.0.0
      install PyRun version 2.0.0 (default)

  --platform=linux-i686
      install PyRun for the given platform; this is usually
      auto-detected
  --platform-list
      list available platform strings

  --pyrun-distribution=pyrun.tgz
      use the given PyRun distribution file; this overrides
      all other distribution selection parameters
  --pyrun-executable=pyrun
      symlink to and use an alternative name for the PyRun
      executable

  --setuptools-distribution=setuptools.tgz
      use the given setuptools distribution file instead of
      downloading it from PyPI
  --setuptools-version=2.1
      install the setuptools 2.1 (default); use
      --setuptools-version=latest to automatically find the
      latest version on PyPI
  --distribute-distribution=distribute.tgz
      alias for --setuptools-distribution

  --pip-distribution=pip.tgz
      use the given pip distribution file instead of
      downloading it from PyPI
  --pip-version=1.4.1
      install the pip 1.4.1 (default);
      use --pip-version=latest
      to automatically find the latest version on PyPI

  --help
      show this text
```

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```
--version
    show the script version
--copyright
    show copyright
--debug
    enable debug output
--disable-certificate-checks
    disable certificate checks when downloading packages;
    this should normally not be needed
```

Without options, the script installs eGenix PyRun, `setuptools` and `pip` in `targetdir`. If no local versions of `setuptools` or `pip` are found, the tools are downloaded from `pypi.python.org`.

install-pyrun is secure

`install-pyrun` will use `curl` as default downloader, and fallback to `wget`, if `curl` is not available. The script defaults to operating the downloaders in secure mode, i.e. all links are HTTPS links and all certificates are verified before proceeding with the download.

Both the `pypi.python.org` and our `downloads.egenix.com` servers use HTTPS for enhanced security.

Manual PyRun installation

If you'd rather install eGenix PyRun manually, you can do so by downloading the prebuilt binaries yourself. Please see the next section for details.

1.3.3 Prebuilt Binary Distribution

Simply download a suitable binary distribution for the version of Python and platform you need and extract it to a base directory where you'd like PyRun to live. Then use the eGenix PyRun executable like you'd use a regular Python interpreter, e.g.

```
./bin/pyrun2.7 myscript.py
```

You can also put `pyrun` into the shebang of the script, e.g.

```
#!/usr/bin/env pyrun2.7
# Hello World Demo
print "Hello World!"
```

Please note that the binary distributions contain more than just the PyRun executable. They also come with a few extra standard library extensions which are normally not part of PyRun and the include files needed to compile Python extensions for use with PyRun.

If you are just looking for the plain single-file PyRun executable, only extract the file `bin/pyrunX.X` (with `X.X` being the underlying Python version, e.g. 2.7) from the binary distributions.

1.3.4 eGenix PyRun Directory Structure

If you want to install other libraries or packages for use in eGenix PyRun, you need to pay a little more attention to where you copy the executable. eGenix PyRun assumes the following directory layout **relative to the executable** (with `X.X` being the underlying Python version, e.g. 2.7):

- `bin/pyrunX.X`
- `lib/pythonX.X`
- `include/pythonX.X` (Python 2) or `include/pythonX.Xm` (Python 3)

The `lib/pythonX.X` directory is used as location of the Python libraries and automatically put on `sys.path` in case it is available. Optional packages installed through `distutils` or `setuptools` will go into the corresponding `lib/pythonX.X/site-packages/` directory.

The `lib/pythonX.X` directory may also contain Python standard library extension modules in the `lib-dynload/` sub-directory which are not integrated into the eGenix PyRun executable. The prebuilt binary distributions come with a set of such extensions.

The `include/pythonX.X` directory is only needed in case you want to compile Python C extensions. It is available as part of the prebuilt binary distributions we make available. For Python 3, the include directory has the ABI flags appended. For Python 3.4, this is `include/python3.4m` for most Python installations.

Please note that while **eGenix PyRun** itself is fully relocatable after installation due to the relative search path, the tools **setuptools** and **pip** are not. They hard-code the paths into their scripts, so you can not relocate a PyRun installation, after these tools have been installed.

1.3.5 Building your own eGenix PyRun binary

In order to build your own version, simply download the above source archive, `untar/unzip` it to a temporary directory and follow these steps:

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```
cd egenix-pyrun-*
cd PyRun
make
make install
```

This will download the Python source distribution and start a build of eGenix PyRun. The result will be installed to the directory [/usr/local/](#) using the directory layout as described above.

If you'd like to build a binary distribution archive, use the following commands instead:

```
cd egenix-pyrun-*
cd PyRun
make distribution
```

You can then pick up the distribution archive from the [dist/](#) directory.

Testing

To run some simple tests, please use the test-distribution target:

```
make test-distribution
```

This will install the distribution you just built, install it locally in a test directory and run a few tests, including pip installations of sizeable packages such as NumPy, Cython and Django.

Note that only the installation itself is tested, not the packages themselves.

Customization Options

If you would rather install to a different directory, you can add the make parameter `PREFIX=/path/to/pyrun/`, This will cause make to install eGenix PyRun in [/path/to/pyrun/](#).

If you want to build against a specific Python version, you can specify the version using the `make` parameter `PYTHONFULLVERSION=2.7.5`. Please have a look at the `PyRun/Makefile` for more ways of customizing the setup.

For future versions of eGenix PyRun, we plan to make the setup customizable via a top-level [setup.py](#) file so you can use Python to trigger the build, customize the included standard lib extension modules and installation.

2. eGenix PyRun Internals

eGenix PyRun uses the standard Python freeze tool, which you can find the [Tools/freeze/](#) directory of the Python source code distribution to combine the Python interpreter with a large subset of the Python standard library into a single-file Python runtime.

We have applied a few customizations to the freeze tool and ship separate versions for Python 2 and Python 3 with the source distribution of eGenix PyRun.

2.1 PyRun Building Parts

In order to use freeze.py for creating PyRun, we had to implement these steps:

- we created a freeze.py template ([PyRun/Runtime/pyrun_template.py](#)) which provides a mostly compatible command line interface to the standard Python interpreter and references the standard library modules that we wanted to include in PyRun,
- we extract the Python configuration information from the Python Makefile and configure files and put this information into a static configuration template ([PyRun/Runtime/pyrun_config_template.py](#)), which is then used by sysconfig.py to load the configuration,
- we extract the Python grammar files the Python stdlib, so that the lib2to3 package can work without having the files loaded from the file system and put this information into a static configuration template ([PyRun/Runtime/pyrun_grammar_template.py](#)), which is then used by lib2to3 to load the configuration,
- we created a script ([PyRun/makepyrun.py](#)) which creates all the necessary pyrun*.py files from the templates,
- we added patches to Python ([PyRun/Runtime/Python-*.patch](#)) and the Modules/Setup files ([PyRun/Runtime/Setup.PyRun-*](#)) to be able to statically link in extension modules that would normally be built

as shared modules and to provide a pure-Python implementation of the Python command line interface.

2.1.1 The PyRun Makefile

The [PyRun/Makefile](#) extracts the Python source code, applies the patches and adds the [Modules/Setup](#) file.

It then creates the [pyrunX.X.py](#) freeze.py template, the [pyrun_config.py](#) module and runs [PyRun/Runtime/freeze/freeze.py](#) on the generated [pyrunX.X.py](#) file.

freeze.py then generates the frozen module versions and a Makefile in [PyRun/Runtime/Makefile](#) which can then be used to build the pyrunX.X executable.

The [PyRun/Makefile](#) also takes care of installing the executable together with the include files and optional shared modules built during the process; as well as packaging the builds into binary .tar.gz files, which can simply be extracted anywhere in the file system to "install" eGenix PyRun.

2.1.2 Adding Python modules/packages to eGenix PyRun

The easiest way to have modules or whole packages added to PyRun is to modify [PyRun/Runtime/pyrun_extras.py](#) and import them in that file.

freeze.py will then automatically find the modules and referenced packages, freeze and add them to PyRun.

Alternatively, you can also edit the [PyRun/Runtime/makepyrun.py](#) file and add the modules/packages in the configuration section near the top of that module.

In a future version of eGenix PyRun, we're going to simplify this process so that you can pass the modules to include as parameter to the build script.

2.1.3 Removing Python modules/packages from eGenix PyRun

If you want to further reduce the PyRun file size, you can remove additional modules/packages from the frozen binary by editing the

[PyRun/Runtime/makepyrun.py](#) file and adding the modules/packages to the remove lists.

In some cases, this may not be enough to completely remove the modules/packages, e.g. if you still have other modules in PyRun which reference the removed modules/packages, `freeze.py` is going to re-add them in the module search process.

To overcome this limitation, you will have to additionally add the modules/packages to the [PyRun/Makefile EXCLUDES](#) variable.

In a future version of eGenix PyRun, we're going to simplify this process so that you can pass the modules to exclude as parameter to the build script.

2.2 Differences compared to Python

eGenix PyRun provides a robust production runtime environment, but has to make some compromises due to the way it is built.

This section explains the enhancements and known incompatibilities compared to a regular Python installation.

2.2.1 Change compare to standard Python

This is a list of changes we have applied compared to standard Python. Unlike the compatibility fixes listed in the next sections, these are features that are not necessary to get eGenix PyRun to work, but ones that we think are slightly more useful than the standard Python choices.

Default PYTHONIOENCODING in Python 3

In Python 3.4, the Python I/O encoding is determined by looking at the locale of the process. Depending on the used system, this can be UTF-8, ASCII or some other encoding.

Since we think it's better to either correctly set the encoding via an environment variable such as `PYTHONIOENCODING` and not guess, we chose to define a default for the `PYTHONIOENCODING` which is used, in case this environment variable is not set.

The default for PYTHONIOENCODING in eGenix PyRun 3.4 is "utf-8:surrogateescape". This allows pyrun to work in most situations without failing prints or weird encoding exceptions.

If you do have a different setup or would like exceptions for non-UTF-8 data to be raised, you can set the PYTHONIOENCODING environment variable to override this default.

It is even possible to have eGenix PyRun revert back to the locale scanning behavior by setting the PYTHONIOENCODING variable to "" (empty string).

2.2.2 Compatibility fixes applied to Python

In order to get some things to work in PyRun, we had to apply a few compatibility fixes to the Python distributions:

Frozen modules always have a `__file__` attribute

In standard Python 2, the attribute is always set to "<frozen>". In standard Python 3, the attribute does not exist at all.

This poses many problems to software relying on this attribute for reporting and debugging purposes (e.g. to show the location of an error) or produce coverage reports.

Since it's impossible to fix all this third party software, we chose to always add the attribute to frozen modules. The attribute is set to "<pyrun>/package/module.py" for all modules frozen into pyrun. This allows most uses of the attribute to work without problems.

Some modules also use this attribute to locate external resources relative to the module location. Since the attribute does not point to an existing path, this will fail, so special work-arounds have to be put in place for such software.

On the positive side, several such modules do take the situation into account that the path does not exist and fall back to other solutions.

Python system configuration included in `pyrun_config.py`

Since the build time information is normally read from the Python installation files, we had to find a way to make this available without going to the file system.

The trick was to use a generated module [pyrun_config.py](#) which has the Python config information and can also patch it at runtime to accommodate for the relocation feature of pyrun.

Note: Python 3 and later versions of Python 2.7 adopted this trick for sysconfig as well.

Integrated lib2to3 grammar files

The lib2to3 package comes with its own pgen2 parser. This parser uses a special set of grammar files for Python's grammar which are embedded into the package.

Since we cannot ship those files in the file system, we chose to store the grammar pickles in a [pyrun_grammar.py](#) helper module and patched the package to use these pickles instead.

This allows lib2to3 to work without having to read the grammar files and makes on-the-fly conversions during installation possible. An important example of a package which uses this technique for Python 3 support is [setuptools](#).

Added list of available lib2to3 fixes to config

The lib2to3 package scans its own fixes/ directory for available fix modules. In a frozen package this doesn't work, so we preprocessed the list, put it into the [pyrun_config.py](#) module and patched lib2to3 to load it from there.

Bug fixes to Python stdlib modules

While porting eGenix PyRun to Python 3.4 we found a couple of bugs in stdlib modules which we patch in pyrun for the supported Python versions and also reported upstream. Please see the change log on the [eGenix product web page](#) for details.

Statically linked standard library modules

In order to have the standard library extensions linked into the pyrun binary instead of having them built as separate module, eGenix PyRun defines additional entries for them in the [Modules/Setup](#) file.

Several modules are documented there, but not all of them. We extracted the relevant information from the Python [setup.py](#) file and added it manually to the [Modules/Setup](#) file for each supported Python version.

Since the [Modules/Setup](#) process is not nearly as flexible as the [setup.py](#) process, configuration of the modules is sometimes very complicated. For this reason we have punted on a few packages such as the `ctypes` package and instead added them to the distributed binaries as separately installable dynamic shared modules.

Note that it is possible to customize these Module/Setup files further in case you would like to add other third party extensions to the pyrun binary.

2.2.3 Standard library modules not linked into PyRun

We have deliberately excluded a number of standard library modules that are either too complicated to build, have license issues or are not needed often enough in our use cases to warrant including in eGenix PyRun:

- `*dbm` modules
- `crypt`
- `readline`
- `parser`
- `tkinter`
- `_multiprocessing`
- all test packages and sub-packages
- `ctypes`
- `nis`
- audio modules
- `_decimal` (in Python 3)

The modules are still built (if the needed development files are found on the build system) and packaged in the eGenix PyRun distribution files, so you can use them, if you need to.

However, they are not statically linked into the PyRun executable, so when moving this file around, you have to make sure that the relative directory structure expected by PyRun (see 1.3.4 eGenix PyRun Directory Structure) makes it possible to find those shared modules.

2.2.4 Include files not included in PyRun executable

For obvious reasons, we cannot include the Python include header files in the PyRun executable, since the compiler/preprocessor will have to find them in order to use them.

We do include the include files in the distribution packages and install-pyrun will also install them, so it's possible to compile Python C extensions if you use one of those distribution forms.

Compiling C extensions is not possible without the include header files, so the single-file PyRun runtime executable is not enough to compile Python C extensions.

2.2.5 Some things that don't work

There are a couple of tricks which Python modules sometimes play, which don't work with frozen modules.

File access to resources in packages

Some standard library modules/packages come with non-Python resource files such as binary .exe stubs or data files. Since freeze.py will only find Python modules, these files are not included in the frozen PyRun executable and since the frozen modules/packages don't live in the file system, access to such resource files is not possible via the module/package path.

Examples of such modules/packages:

- idllib
- distutils' bdist_wininst (the rest of distutils works fine)
- pkgutil on frozen packages (it works on frozen modules in Python 2.7)
- several test modules/packages (not included anyway)

For the lib2to3 package, which also needs external files, we have patched the package and included the necessary grammar files in the pyrun binary, since it is used by several Python packages during installation on Python 3.

Running frozen packages with -m

The pkgutil module which is needed to implement the -m option in Python only has limited support for frozen modules in Python 2.7 and 3.4. It has no support for frozen packages. As a result, running `pyrun2.7 -m timeit` works, but e.g. `pyrun2.7 -m lib2to3 --help` doesn't.

Python test suite issues

Running the Python test suite shows some strange issues which we have not yet tracked down:

- Some test modules hang when run with `regtest.py`, e.g. `test_docxmlrpc`
- Test modules cause strange errors (mostly encoding errors) when run with `regtest.py`. Running the test modules directly doesn't show these errors. Some preliminary investigation suggests that these issues could be caused by `regtest.py` modifying the module `__path__` entries.

Not all Python command line options available

Because eGenix PyRun has to emulate the command line options in Python, it is difficult to emulate some Python command line option which take effect in the very early stages of the interpreter startup phase.

For some options like e.g. `-d` (debug level) and `-O` (optimization level), we have added helpers/patches to Python to make it possible adjusting them from Python.

Fortunately, most of the more exotic options are not used in production runtime environments for which eGenix PyRun is designed.

3. Examples of Use

Here's a short session installing `setuptools`, `pip` and our `egenix-mx-base` package in an eGenix PyRun installation.

First, we install a PyRun version for 32-bit Linux:

```
mkdir tmp
cd tmp
wget http://downloads.egenix.com/python/egenix-pyrun-2.0.0-py2.7\_ucs2.linux-i686.tgz
tar xvfz egenix-pyrun-2.0.0-py2.7_ucs2.linux-i686.tgz
```

Now we have a ready to use Python runtime in `tmp/`, using the default eGenix PyRun directory layout, including some optional extra shared libraries and the include files needed for compiling Python C extensions.

Now, we install `setuptools` into this runtime:

```
wget http://pypi.python.org/packages/source/s/setuptools/setuptools-2.1.tar.gz
cd setuptools-2.1
../bin/pyrun2.7 setup.py install
cd ..
rm -rf setuptools-2.1
```

Installing `pip` is just as easy:

```
wget http://pypi.python.org/packages/source/p/pip/pip-1.4.1.tar.gz
cd pip-1.4.1
../bin/pyrun2.7 setup.py install
cd ..
rm -rf pip-1.4.1
```

You can then install other Python packages using the usual installation methods:

```
bin/pip install egenix-mx-base
```

and the packages are available to eGenix PyRun just as they would in a regular Python installation:

```
$ bin/pyrun2.7
eGenix PyRun 2.7.6 (release 2.0.0, default, Jun 13 2014, 20:12:35)
[GCC 4.5.0 20100604 [gcc-4_5-branch revision 160292]]
Thank you for using eGenix PyRun. Type "help" or "license" for
details.

>>> import mx.DateTime
>>> mx.DateTime.now()
<mx.DateTime.DateTime object for '2013-06-13 20:26:30.62' at
7f1845a6a300>
>>>
```

3.1 eGenix PyRun Command Line Options

These are eGenix PyRun's command line options. They are shown if you start the PyRun executable with option `-h`:

```
$ bin/ /pyrun3.4 -h
Usage: pyrun [pyrunoptions] <script> [parameters]

Version: 3.4.1 (release 2.0.0, default, Jun 13 2014, 21:13:02)
[GCC 4.5.1 20101208 [gcc-4_5-branch revision 167585]]

Available pyrun options:

-h:  show this help text
-v:  run in verbose mode
-i:  enable interactive mode
-m:  import and run a module <script> available on PYTHONPATH
-c:  compile and run <script> directly as Python code
-b:  run the given <script> file as bytecode
-E:  ignore environment variables (only PYTHONPATH)
-S:  skip running site.main() and disable support for .pth files
-O:  run in optimized mode (-OO also removes doc-strings)
-u:  open stdout/stderr in unbuffered mode
-d:  enable debug mode
-V:  print the pyrun version and exit
```

Without options, the given <script> file is loaded and run. Parameters are passed to the script via `sys.argv` as normal.

The exact output is subject to changes between eGenix PyRun versions.

The meaning of most options is similar to the Python interpreter command line options of the same name.

Note that not all options are available, since it is difficult to emulate them in pure Python. Even some of the above options were only possible using patches to Python, e.g. the `-d` and `-O` options.

3.2 Debugging eGenix PyRun Installations

If you need to debug PyRun installations, you can use `-dd` to have PyRun display paths and setting variables at startup:

```
$ bin/pyrun2.7 -dd
### PyRun Debug Information

# Name and version
pyrun_name = 'pyrun'
pyrun_version = '2.7.6'
pyrun_libversion = '2.7'
pyrun_release = '2.0.0'
```

3. Examples of Use

```
pyrun_build = '(release 2.0.0, default, Jun 13 2014, 21:47:11)
\n[GCC 4.5.1 20101208 [gcc-4_5-branch revision 167585]]'

# Files and directories
pyrun_executable = '/tmp/pyrun2/bin/pyrun2.7'
pyrun_dir = '/tmp/pyrun2/bin'
pyrun_binary = 'pyrun2.7'
pyrun_prefix = '/tmp/pyrun2'
pyrun_bindir = 'bin'

# Options
pyrun_verbose = 0
pyrun_debug = 2
pyrun_as_module = False
pyrun_as_string = False
pyrun_bytecode = False
pyrun_ignore_environment = False
pyrun_ignore_pth_files = False
pyrun_interactive = False
pyrun_unbuffered = False
pyrun_optimized = 0

pyrun: Setting up sys.path
pyrun: sys.path before adjusting it (compile time version):
pyrun: /tmp/pyrun2/bin
pyrun: sys.path after adjusting it (before cleanup):
pyrun: /tmp/pyrun2/lib/python2.7/site-packages/setuptools-2.1-
py2.7.egg
pyrun: /tmp/pyrun2/lib/python2.7/site-packages/pip-1.4.1-
py2.7.egg
pyrun: /tmp/pyrun2
pyrun: /tmp/pyrun2/lib/python2.7
pyrun: /tmp/pyrun2/lib/python2.7/lib-dynload
pyrun: /tmp/pyrun2/lib/python2.7/site-packages
pyrun: sys.path final version:
pyrun: /tmp/pyrun2/lib/python2.7/site-packages/setuptools-2.1-
py2.7.egg
pyrun: /tmp/pyrun2/lib/python2.7/site-packages/pip-1.4.1-
py2.7.egg
pyrun: /tmp/pyrun2
pyrun: /tmp/pyrun2/lib/python2.7
pyrun: /tmp/pyrun2/lib/python2.7/lib-dynload
pyrun: /tmp/pyrun2/lib/python2.7/site-packages
pyrun: Importing site.py
pyrun: sys.path before importing site:
pyrun: /tmp/pyrun2/lib/python2.7/site-packages/setuptools-2.1-
py2.7.egg
pyrun: /tmp/pyrun2/lib/python2.7/site-packages/pip-1.4.1-
py2.7.egg
pyrun: /tmp/pyrun2
pyrun: /tmp/pyrun2/lib/python2.7
pyrun: /tmp/pyrun2/lib/python2.7/lib-dynload
pyrun: /tmp/pyrun2/lib/python2.7/site-packages
pyrun: sys.path after importing site:
pyrun: /tmp/pyrun2/lib/python2.7/site-packages/setuptools-2.1-
py2.7.egg
pyrun: /tmp/pyrun2/lib/python2.7/site-packages/pip-1.4.1-
py2.7.egg
pyrun: /tmp/pyrun2
pyrun: /tmp/pyrun2/lib/python2.7
pyrun: /tmp/pyrun2/lib/python2.7/lib-dynload
pyrun: /tmp/pyrun2/lib/python2.7/site-packages
eGenix PyRun 2.7.6 (release 2.0.0, default, Jun 13 2014, 21:47:11)
[GCC 4.5.1 20101208 [gcc-4_5-branch revision 167585]]
```

eGenix PyRun - One file Python runtime

```
Thank you for using eGenix PyRun. Type "help" or "license" for  
details.
```

```
>>>
```

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