KOLT Python

Python Modules and Third-Party Packages

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Agenda

1. Python Modules and Packages

2. Package Management

3. Virtual Environments

Python Modules

- Modules are files that contains Python statements and definitions
- Modules help you to break down large programs into small manageable and organized files
- Modules provides reusability of a code
- Most used functions can be defined in Modules and can be used in other programs without copying the definitions into every program
- To use definitions in modules, modules are needed to be **imported**

Python Packages

- Packages can be thought as directories in which multiple modules are present
- Packages are organized hierarchically
- Packages can contain subpackages as well as regular modules
- All packages are modules but not all modules are packages

Importing Modules

Import a module:

`import module_name` # all definitions

`import module_name as name` # module can be used with ”name”

`from module_name import func1` # only specified names, func1

`from module_name import func1 as function` # func1 will be used by calling ”function”

`from module_name import *` # all names in module

Python Package Index (PyPI)

Repository of software for the Python programming language.

- 23,000+ Python3 packages.
- If you want a package, PyPI probably has it.

Visit *pypi.org* to explore packages.

pip

- Recommended tool for installing Python packages.
- **`pip`** is already installed with modern Python distributions.
- Try `pip -V` on your command line/terminal(`pip3 -V` for Macs).

```
$ pip -V
pip 20.0.2 from --PATH_TO_PIP-- (python 3.5)
$ python -m pip -V
pip 20.0.2 from --PATH_TO_PIP-- (python
version)
```

Common pip commands

Install a package:

```
$ pip install package_name # latest version
$ pip install package_name==1.0.1 # specific version
$ pip install package_name>=1.0.1 # minimum version
```

Uninstall a package:

```
$ pip uninstall package_name
```

Update a package:

```
$ pip install --upgrade package_name
```

Search PyPI for matches:

```
$ pip search query
```

Virtual Environments

A *virtual environment* is an **isolated** Python environment that contains the Python interpreter, installed **libraries** and scripts.
Why do we need them?
What happens if two different programs use the same library?

- We might want to use different versions of the same library.
- Updating a library for **Program A** can harm another **Program B**. (*Breaking Changes*)
- We want **isolation** between programs.

Creating Virtual Environments

In Python 3.6+, the recommended way to create a virtual environment is using **venv** package, which is included in the standard installation (similar to **pip**).

Creating a virtual environment:

```
$ python -m venv /path/to/new/virtualenv
```

Activating a virtual environment:

cd(Change directory) to virtual environment folder.

In Windows: `$ Scripts\activate`

In Mac/Linux: `$ source bin/activate`

Deactivating a virtual environment:

```
$ deactivate
```