Weekend: Intro to Python

Introduction To Python

Python was created in the late 1980's by Guido Van Rossum as a hobby project developed over the Christmas holiday. Since then, it has grown into one of the largest, and most extensive programming languages out there.

Python code is maintained and supported by the Python Software Foundation. Its creator Guido is actively involved in its progress and was given the title Benevolent Dictator For Life.

Python is a general-purpose programming language. It is used in various fields such as mathematics, agriculture, electronics, and mechanics.

It is a **Strongly Typed** language- meaning that every object in Python has a definite type associated with it.

It is also **Dynamically Typed**- meaning that no type checking is done prior to running Python code.

Python is an **Interpreted Language**. This means that code *compilation* and *execution* is done at the same time.

Where can we use Python?

The Python language is used in many different fields.

- **Web Development** - Python is used to create really dynamic websites using frameworks like **Flask**, **Django**, and **Pyramid**.
- **Scientific Computing** - It has several libraries dedicated to it for scientific computing like **numpy**, and **earthpy** for earth sciences.
- **Game Development** - Python has a gaming library called **pygame** for creating games that use keyboard and mouse interactions.
- **Desktop Applications** - Python comes with **tkinter** a graphical user interface library that allows us to create user interfaces for our applications.

These are just a few examples of where Python language is applied.

Who uses Python?

Several companies use Python in their day to day runnings. Here is a list of just a few:

- Google (YouTube)
- Facebook (Tornado)
- Dropbox
- Yahoo

- NASA
- IBM
- Mozilla
- Quora
- Instagram
- Reddit
- Disney

Helpful Resources

Official Python Documentation (https://docs.python.org/3/)

Documentation for Python's standard library, along with tutorials and guides, are available . The Python documentation might look scary at first, but as we go along you will find it is really easy to understand and a very powerful resource.

Google (https://www.google.com)

When in doubt, **Google** it. We will find most of the problems we might encounter in programming have been encountered by other developers as well. Google should be our first line of defense when we encounter an error we have never seen before or for research.

StackOverflow (https://www.stackoverflow.com)

With a large active community of developers, StackOverflow is the place where we will find ourselves looking for answers to our programming questions. It is a very useful resource to have.

Tutorialspoint (https://www.tutorialspoint.com/python3/)

This is a good resource for quick information, and examples of different concepts in Python.

Learn Python the Hard Way (https://learnpythonthehardway.org/python3/)

This is really awesome for a hands-on approach to Python. At this site, you will get to learn Python topics and complete exercises on them.

Installations

Most Mac and Linux systems have Python pre-installed.

In this course we will be using **Python3** . This was a major version update from **Python2** with new features and syntax changes. Python3 is also the future of Python and is best we learn how to use it.

Linux Installation

Step 1: Check if Python3.6 is Installed

Open the terminal and type in `python3.6`.

```
$ python3.6
```

If you get the following error:

```
python3.6: command not found
```

it means that Python is not installed - follow the next steps in this section for installation instructions.

The console may give you a message that Python is not installed, followed by a command that will install it for you. In that case, follow the instructions in the console.

If it does not give an error, it means you have `python3.6` installed and you can move on to the **Installing Third Party Modules** section below.

Step 2: Install Python3.6

On the terminal copy the following individual commands on your console.

```
$ sudo add-apt-repository ppa:jonathonf/python-3.6
$ sudo apt-get update
$ sudo apt-get install python3.6
```

When prompted put in your password and leave the commands to run.

Step 3 : Confirm Installation

On the terminal type in `python3.6`. If the output looks like this, it means that Python has installed successfully.

```
 $ python3.6

Python 3.6.0 (default, Nov 17 2016, 17:05:23)
[GCC 5.4.0 20160609] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

To get out of this interface use the `exit()` function like this:

```
$ python3.6
>>>exit()
```

Now go to Installing third party modules below.

Mac Installation

Step 1: Check if Python3.6 is Installed

Open the terminal and type in `python3.6`.

```
$ python3.6
```

If you get the following error:

```
python3.6: command not found
```

it means that Python is not installed - follow the next steps in this section for installation instructions.

If it does not give an error, it means you have `python3.6` installed and you can move on to the **Installing Third Party Modules** section below.

Step 2: Download Python3 latest release

Go to the **Downloads page (https://www.python.org/downloads/)** on the Python website and download the latest release of Python 3 by clicking the button at the top of the page.

Step 3: Install Downloaded File

Install the downloaded file by following the installation instructions that follow.

Step 4 : Confirm Installation

On the terminal type in `python3.6`. If the output looks like this, it means that Python has installed successfully.

```
Python 3.6.0 (default, Nov 17 2016, 17:05:23)
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

To get out of this interface use the `exit()` function like this:

```
 $ python3.6

Python 3.6.0 (default, Nov 17 2016, 17:05:23)
[GCC 5.4.0 20160609] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>>exit()
```

Installing Third Party Modules

Other than the built-in standard library of modules, Python developers have created their own modules to further extend Python's functionality.

The best way to install these Python modules is to use Python's **pip** tool. Pip is a tool for installing and managing Python packages, many of which are found in the **Python Package Index (https://pypi.python.org/)**. It's kind of like a free application store for Python modules.

Installing pip3

Pip comes installed with Python on Mac when you install Python3.

For Linux, run this command:

```
$ sudo apt-get install python3-pip
```

Alternatively, if you run into any error using the above command you can use the following:

This command downloads the script that we will use to install pip.

```
$ sudo curl https://bootstrap.pypa.io/get-pip.py -o get-pip.py
```

Then, using python3.6, we run the downloaded script to install pip.

```
$ sudo python3.6 get-pip.py
```

Once installations are done, we can move on and start learning some Python.