

# Python Fundamentals

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## 1. GETTING STARTED



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# Getting Started - Objectives

1.1

- What is Python
- Why learn and use Python
- What is Python Good At
- How is Python managed
- How to Install Python
- Python IDLE
- How to run Python programs
- How does Python run your program
- How to Install PyCharm
- Other Resources

# What is Python

1.2

- Python was created by Guido Van Rossum year 1991
- Python is an interpreted high level programming language for general purpose programming
- Programming language is formal language which allows programmer to write specific instructions to be executed on computer.
- Term 'Python' is also used for a software program called interpreter
- Python interpreter is the program which reads, evaluates and executes instructions written using python programming language

# Why learn and use Python

1.3

- **Easy to learn, yet extremely powerful**
  - Simple syntax
  - Advanced data structure
- **Software Quality**
  - Easy to read/maintain code
  - Forces code indentations as per design
- **Developer productivity**
  - No build time
  - Lesser code in comparison to Java/C++
- **Strong support**
  - Large collection of standard libraries
  - Strong community support
- **General purpose**
  - Used for multipurpose e.g. automation/monitoring etc.

# What is Python Good At

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- Python is a general purpose programming language
  - Scripting Task – Automating repetitive tasks/System Admin jobs
  - Web Development
  - Data Science
  - Machine Learning
  - Numerical and Scientific Computing
- A lot of big companies use Python
  - Google, Facebook, NASA, JP Morgan, Atlassian etc
- Python is not right choice for
  - Low Latency Applications where speed matters
  - Embedded systems (low level hardware interaction)
  - Mobile Development

# How is Python managed

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- Python Software Foundation (PSF) manages and oversees the development and roadmap for Python development
- PSF is a non-profit organization , it also deals with intellectual property issues.
- PSF also organizes Python conferences and these conferences are called *PyCon*, and are organized in all major cities in the world

# How to install Python

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- Python can be downloaded and installed from standard installers which are available on Python official website.
- <https://www.python.org/downloads/>
- You can get choose from various installers depending on the operating system and version you want to install.



- Once the installer has finished the setup you can verify if the python is installed by typing the below command on the command prompt or terminal of your operating system

```
$ python --version
```

- This will confirm if the python is installed and displays the version of the Python installed on your machine.

```
C:\>python --version
Python 3.6.4

C:\>python
Python 3.6.4 (v3.6.4:d48ebeb, Dec 19 2017, 06:54:40) [MSC v.1900 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> |
```

# Python IDLE

1.7

- Python IDLE (*Integrated Development and Learning Environment*) is installed as part of Python installation
- IDLE is equivalent of command prompt in windows and terminal session in Linux/Mac environment.
- On Windows you can find IDLE in Start button menu for Python after Python install
- You can execute python statements in IDLE
- Its also known as REPL (R-Read E-evaluate P-Print L-Loop)
- Its similar to Python prompt with added features like auto-indent, code completion , code highlighting etc.
- Other available IDE are PyCharm, PyDev, Spyder, Eclipse etc
- We will use PyCharm through out this course for writing python programs



# How to run Python program

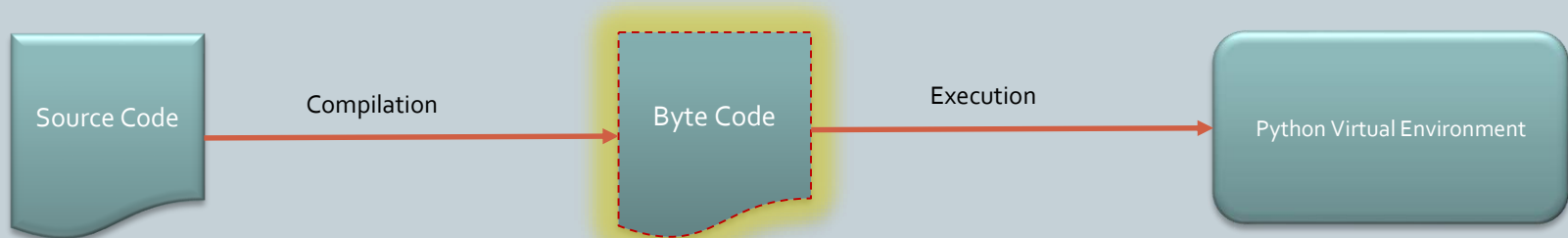
1.8

- You can run your python code interactively or via a python file
- You can execute python statements interactively on python prompt or using IDLE
- Code typed on python interactive prompt is never stored; lost after execution
- For saving your code, you need to write the code in a text file and save this file
- Code files are saved with extension `".py"`. These are also called modules or programs
- Python modules or programs can be run with the same python command and by providing the module name(along with extension)  
e.g. `python myprogram.py`
- Myprogram.py is the name of the file you created which contains the python code to be executed.

# How Python runs the program

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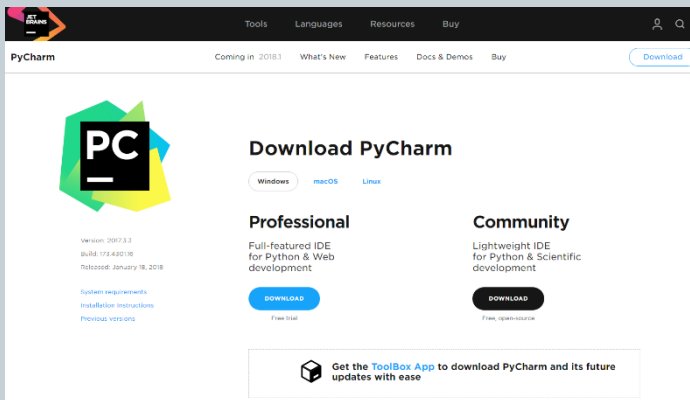
- Python first compiles your source code into byte code.
- Byte code runs faster than text statements in your python file
- Byte code is stored in a file .pyc, if python has write access to your machine
- In Python 3.2 and later byte code is stored in `__pycache__` directory. File name also has the python version which created the byte code.
- When you run the program second time, python directly loads the .pyc file and skips the compilation if:
  - Source code is not changed since the last compilation time
  - Python version is the same with which the byte code file was created



# PyCharm – How to install

1.10

- PyCharm is a complete IDE from JetBrains
- PyCharm has a commercial (paid) and community(free) variant.
- Besides Windows or Mac OS you can also install PyCharm on Linux Desktop
- Installer can be downloaded from <https://www.jetbrains.com/pycharm/download/>



- Double click on the installer and follow the instructions to complete the installation
- Once installed you can find PyCharm under Start Menu -> All Programs -> Jet Brains -> PyCharm
- Alternatively you can also download JetBrains Toolbox for other products e.g. IntelliJ

# Python – Other Resources

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- Python Official documentation is a great source @ <https://www.python.org/doc/>
- Python Tutor Mailing Lists @ <http://www.python.org/mailman/listinfo/tutor>
- Github Repository for the tutorial <https://github.com/quantfinart/Fundamental-Python-Tutorial>