Experiment 1

Aim: Introduction to Python, its installation and Modes of Execution.

Introduction to Python

➤ Python is a high-level, interpreted, object-oriented programming language.
➤ It was developed by Guido Van Rossum in 1991 with the first version Python 0.9.0.
➤ The latest version of Python is 3.10.5 released on 6th June 2022.

Features of Python

1) **Object Oriented** - Python supports Object-Oriented programming that encapsulates code within objects.
2) **Interpreted language** – interpreter executes the code line by line as soon as it is written.
3) **Platform Independent -** Python works on different platforms such as Windows, MacOS, Linux etc.
4) **Open source** – it is free to use and distribute, even for commercial purposes.
5) **Portable** – Python can run on a wide variety of hardware platforms.
6) **Less Complex** - allows developers to solve complex problems in less time with fewer lines of code.
7) **Versatile** - Python can be used for many different tasks, from web development to machine learning.
8) **User-friendly syntax:** Python has a simple syntax similar to the English language so it is easier to read and understand.
9) **Easy to read and maintain** - It uses Indentation (whitespace) to define scope of loops, functions and classes. It offers simple structure, and a clearly defined syntax.
10) **Broad standard library** – It has rich libraries of pre-defined functions for numerous applications like:
    - Desktop Applications
    - Web Applications
    - Software Development
    - Data Analysis and Preprocessing (text, images, videos, etc.)
    - Machine Learning
    - Artificial Intelligence
    - Data Science
    - Robotics
    - Gaming
    - Mobile Apps
11) Python language is being used by almost all tech-giant companies like – Google, Amazon, Facebook, Instagram, Dropbox, etc.
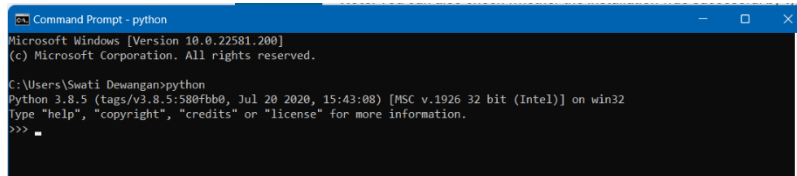
Installation of Python

To install python on a local machine or computer the following steps is to be followed:

Procedure:

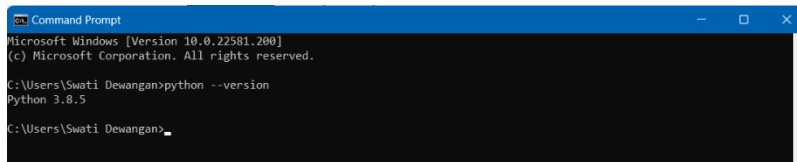**Step 1**: Check if the system already have Python installed:

    a) Go to Command Prompt and type *python*. If it is installed the python shell will be opened to access.

    b) Or type *python –version* to find the latest version of the installed python.

Step 2: If not installed, visit the link *https://www.python.org/downloads/* to download the latest release of Python. The most stable Windows downloads are available from the Python for Windows page.
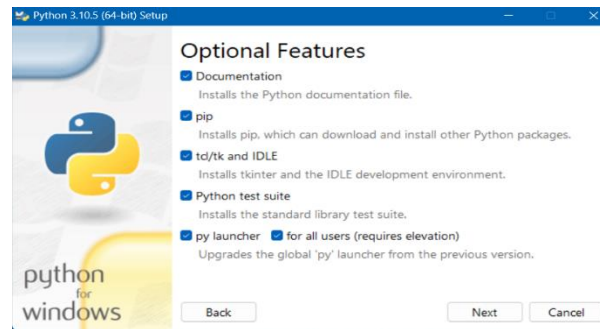


a) Download Python Executable Installer and install it

b) Double-click the executable file, which is downloaded; the following window will open.
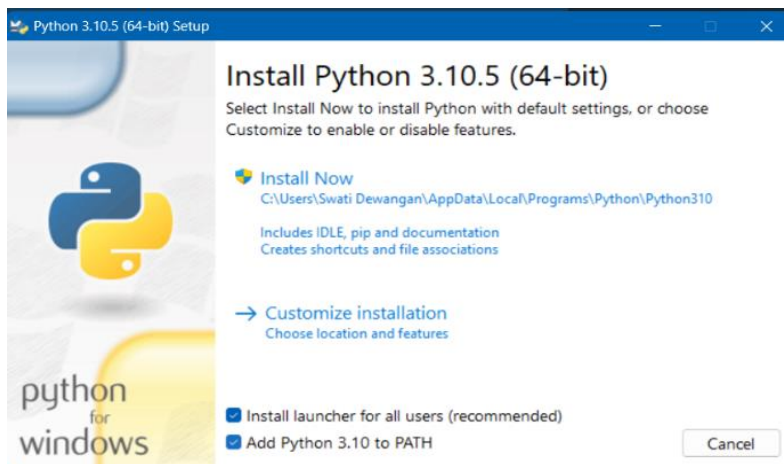
c) Select Customize installation and click on the Add Path check box, it will set the Python path automatically. Choose the optional features by checking all the check boxes and click Next.

d) This takes you to **Advanced Options** available while installing Python. Here, select the '**Install for all users**' and '**Add Python to environment variables**' check boxes. Click on **Install** to start installation.
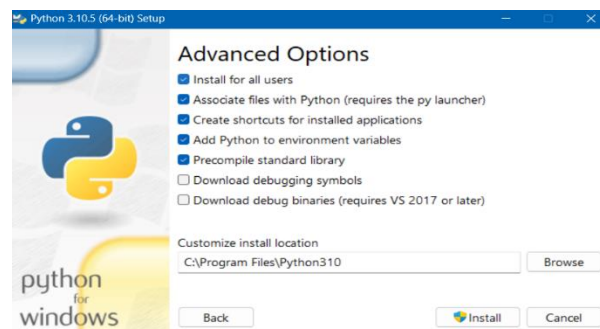
e) Once the installation is over, you will see a **Python Setup Successful** window. To check if Python 3.9.4 has been successfully installed in our system,

f) Open cmd prompt in your system Run *python –version* command

Modes of Execution

g) Python programming language can be executed in the following two modes:

1. Interactive mode

   a) **Python Shell**

   Python Shell is a command line tool that starts up the python interpreter to read a Python statement, evaluate the result of that statement and then prints the result on the screen.

   b) **IDLE**

   In Windows search Type IDLE. It is an acronym of "Integrated DeveLopment Environment".

   It is an interactive interpreter known as shell which is similar to Python shell.

   c) **Anaconda**

   Installing Anaconda Software and open Jupyter Notebook.

d) Google Colab

- Colaboratory, or "Colab" for short, is a product from Google Research.

- It allows anybody to write and execute python code through the browser.

- It is a hosted Jupyter notebook service that It requires no setup to use and is free of charge to computing resources including GPUs.

- It is especially used for machine learning, deep learning and data analysis.

2. Script mode

- Python programs are written in editors and saved as the file with the .py extension

- These files file that can be executed further.

- By default, the Python scripts are saved in the Python installation folder.

Conclusion:

Hence, learned the introductory note on Python and its execution modes.