# SE-Assignment-6

Assignment: Introduction to Python

Instructions:

Answer the following questions based on your understanding of Python programming. Provide detailed explanations and examples where appropriate.

Questions:

1. Python Basics:

- What is Python, and what are some of its key features that make it popular among developers? Provide examples of use cases where Python is particularly effective.

**ANSWER:**

**Python is a programming language. One of Python's key benefits is its ability to automate manual, repetitive tasks. With Python, you can learn how to automate just about anything by using either built-in modules or pre-written code from its robust library. Or you can write your own custom scripts to perform specific actions.**

2. Installing Python:

- Describe the steps to install Python on your operating system (Windows, macOS, or Linux). Include how to verify the installation and set up a virtual environment.

**ANSWER:**

**To install Python on a Windows operating system, follow these detailed steps:**

**Step-by-Step Guide to Install Python on Windows**

**Download Python Installer:**

**Go to the official Python website: python.org.**

**Navigate to the Downloads section and select the latest stable release for Windows. Click on the "Download Python" button.**

**Run the Installer:**

**Once the installer is downloaded, locate the file (usually in your Downloads folder) and double-click it to run.**

**Customize Installation Options:**

**Add Python to PATH: On the first installer screen, check the box that says "Add Python to PATH". This ensures you can run Python from the command line.**

**Click on "Customize installation" for more options or "Install Now" for a default installation.**

**Customize Installation (if chosen):**

**On the "Optional Features" screen, ensure the following options are checked:**

**Documentation**

**pip (Python's package installer)**

**tcl/tk and IDLE (Integrated Development and Learning Environment)**

**Python test suite**

**py launcher**

**Click "Next".**

**On the "Advanced Options" screen, you can choose to install Python for all users or keep the default settings. It’s also recommended to check the box for "Install for all users".**

**Choose an installation directory or accept the default location (e.g., C:\Program Files\Python39\ for Python 3.9).**

**Complete the Installation:**

**Click "Install" to begin the installation process.**

**Wait for the installation to complete. It might take a few minutes.**

**Once the installation is complete, you will see a screen that says "Setup was successful". Click "Close" to finish.**

**Verify the Installation:**

**Open Command Prompt:**

**Press Win + R, type cmd, and press Enter.**

3. Python Syntax and Semantics:

- Write a simple Python program that prints "Hello, World!" to the console. Explain the basic syntax elements used in the program.

**ANSWER:**

**print(“Hello, World”)**

4. Data Types and Variables:

- List and describe the basic data types in Python. Write a short script that demonstrates how to create and use variables of different data types.

**ANSWER:**

1. **Interger  a whole number, positive or negative, without decimals, of unlimited length.**
2. **Boolean value is either true or false. In Python, the two Boolean values are True and False, and the Python type is bool.**
3. **A string is a sequence of characters enclosed in either single quotes ('') or double quotes (“”).**
4. **Float used to store positive and negative numbers with a decimal point**

5. Control Structures:

- Explain the use of conditional statements and loops in Python. Provide examples of an `if-else` statement and a `for` loop.

**ANSWER:**

**The use of conditional statements in python is to test what the code must run against and to set what the code must do when the certain required conditions are met.**

**The use of loops to repeatedly execute a group of statements as long as the condition is satisfied.**

6. Functions in Python:

- What are functions in Python, and why are they useful? Write a Python function that takes two arguments and returns their sum. Include an example of how to call this function.

**ANSWER:**

**A function in Python is a block of statements that return the specific task. The idea is to put some commonly or repeatedly done tasks together and make a function so that instead of writing the same code again and again for different inputs, we can do the function calls to reuse code contained in it over and over again.**

7. Lists and Dictionaries:

- Describe the differences between lists and dictionaries in Python. Write a script that creates a list of numbers and a dictionary with some key-value pairs, then demonstrates basic operations on both.

**ANSWER:**

**Lists and Dictionaries are different data structures in Python. Lists are ordered collections of items, whereas the dictionary is an unordered collection of data in a key: value pair form.**

8. Exception Handling:

- What is exception handling in Python? Provide an example of how to use `try`, `except`, and `finally` blocks to handle errors in a Python script.

**ANSWER:**

**Exception handling allows the program to continue to execute even if an error occurs.**

9. Modules and Packages:

- Explain the concepts of modules and packages in Python. How can you import and use a module in your script? Provide an example using the `math` module.

10. File I/O:

- How do you read from and write to files in Python? Write a script that reads the content of a file and prints it to the console, and another script that writes a list of strings to a file.