Assignment 1: 01/09/2025

1.What is Python and why is it called an interpreted language?

Python is a high-level, general-purpose programming language created for readability and simplicity. It is called an interpreted language because Python code is executed line by line by the Python interpreter, instead of being compiled into machine code beforehand. This makes debugging easier but can be slower than compiled languages.

2.What are the key features of Python that make it popular for beginners and professionals?

Simple and easy to learn – Syntax is close to English. - Interpreted – Runs without compilation. Dynamically typed – No need to declare variable types. - Portable – Runs on different platforms (Windows, Linux, macOS). - Extensive libraries – Huge collection of built-in and third-party libraries. - Object-oriented and procedural – Supports multiple programming paradigms. - Large community support – Active user base, lots of documentation.

3.What is the difference between Python 2 and Python 3?

Python 2: Older version (no longer officially supported). - print was a statement → print "Hello". Division of integers truncated the result (5/2 → 2). - Unicode support was limited. Python 3: Current and future version. - print is a function → print("Hello"). - Division of integers gives float (5/2 → 2.5). - Full Unicode support. In short: Python 3 is modern, recommended, and has better features.

4.What are Python’s applications in real-world projects?

Web development – Django, Flask. - Data science & Machine learning – Pandas, NumPy,TensorFlow, Scikit-learn. - Automation & scripting – Automating tasks, system scripts. - Game development – Pygame, Panda3D. - Desktop applications – Tkinter, PyQt. - Networking & Security – Scapy, socket programming. - IoT & Embedded systems – MicroPython, Raspberry Pi projects.

5.What is PEP 8 and why is it important in Python programming?

PEP 8 = Python Enhancement Proposal #8. It is the style guide for writing clean and readable Python code (naming conventions, indentation, spacing, line length, etc.). Importance: - Improves code readability. - Makes code consistent across projects. - Easier for teams to collaborate.

6.Who developed Python and in which year was it released?

Developed by Guido van Rossum. First released in 1991.

7.What do you mean by “dynamically typed” in Python?

In Python, you don’t need to declare variable types explicitly. Example: x = 10 # integer x = "hello" # now string The interpreter automatically determines the type at runtime, not at compile time.

8.What is the difference between a compiler and an interpreter, and which does Python use?

Compiler: Translates the entire program into machine code before execution (e.g., C, C++). Faster execution. Interpreter: Translates and executes code line by line (e.g., Python, JavaScript). Easier debugging but slower. Python uses an interpreter (CPython is the default implementation).