MACHINE LEARNING WITH PYTHON - DAY 01

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

Python is a high-level programming language that is simple and beginner-friendly. It is called an interpreted language because code is executed line by line by the Python interpreter, which makes it easy to test and debug.

Flow of Execution:

Python Code (.py file) → Python Interpreter → Executes Line by Line → Output

2. What are the key features of Python that make it popular?

Key Features:
• Simple syntax (like English)
• Open Source and Free
• Cross-Platform (Windows, Linux, Mac)
• Rich Libraries (NumPy, Pandas, TensorFlow)
• Object-Oriented and Procedural
• Used in all fields: Web, Data, AI, Games
Python is useful for both beginners (easy learning) and professionals (AI, ML, Data).

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

Feature	Python 2	Python 3
Print	print "Hello"	print("Hello")
Strings	ASCII by default	Unicode by default
Division	5/2 = 2	5/2 = 2.5
Status	Deprecated (2020)	Active and Recommended

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

Applications:
• Web Development (Django, Flask)
• Data Science & Machine Learning (Pandas, NumPy, TensorFlow)
• Automation (scripts, bots)
• Game Development (Pygame)
• Research/Science (NASA, simulations)
• Finance (risk analysis, stock prediction)
Python is used in Web, Data/ML, Automation, Games, Science, and Finance.

5. What is PEP 8 and why is it important?

PEP 8 is the official style guide for Python. It provides rules for writing clean, readable, and consistent code. Following PEP 8 makes debugging easier and helps teams work together smoothly.

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

Python was created by Guido van Rossum in the late 1980s and released in 1991. He wanted a language that was simple, clear, and beginner-friendly.

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

In Python, variables do not need a fixed type. The interpreter assigns the type at runtime.
Example:

```
x = 10   # integer
x = 'Hi' # now string
```

Variable can change type at runtime.

8. What is the difference between a compiler and an interpreter?

• Compiler: Translates whole code into machine code before execution (e.g., C, Java).
• Interpreter: Runs code line by line (Python).

Python mainly uses an interpreter but internally compiles code to bytecode.

Diagram:

Compiler = Full translation → Output; Interpreter = Line by line execution → Output.

PYTHON

LEVELS OF PROGRAMMING

1. Machine Level: Uses 0s and 1s.
2. Assembly Level: Uses mnemonics like ADD, SUB.
3. High Level: Human-readable (Python, Java, C++).

Diagram:

Machine Level → Assembly Level → High Level.