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.

# 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.