Python For ML

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📘 Week 1: Core Python for Machine Learning (with OOP)

Objective: Equip learners with the Python essentials **+ OOP basics** required for real-world ML projects.

✅ Class 1: Python Setup & Programming Fundamentals

Topics:

- Anaconda / Miniconda installation
- Intro to Jupyter Notebook & VS Code
- Variables, Data Types, Type Casting
- input() and print()
- Comments and indentation rules

Practice:

- Write a program to take user input and calculate BMI
- Print your name, age, and favorite number

✅ Class 2: Control Flow and Loops

Topics:

- if, elif, else conditions
- Comparison & logical operators
- for, while loops
- break, continue, pass

- range(), enumerate()

Practice:

- Write a program to label numbers 1–50 as even/odd
- Guess the number game
- Create a simple grading system

✅ Class 3: Data Structures in Depth

Topics:

- Lists, Tuples: indexing, slicing, updating
- Dictionaries: key-value access, loops, nesting
- Sets: unique values, union/intersection
- Common functions: len(), sum(), sorted(), zip(), map(), filter()

Practice:

- Store and sort student grades
- Remove duplicates from a list
- Extract top N elements from a dictionary

✅ Class 4: Functions and OOP Basics

Part A – Functions:

- Defining functions with parameters
- Return values
- Default arguments, *args, **kwargs
- Lambda functions

Part B – OOP Introduction:

- What is OOP?
- Define a class with __init__()

- Creating objects
- Instance variables and methods

Practice:

- Function to normalize a list
- Create a class Student with name, marks, and a method to compute grade
- Create 3 objects and call their methods

✅ Class 5: File Handling, Exception Handling & OOP in Practice

Topics:

- Reading/writing text files (with open)
- try, except, finally blocks
- OOP continued:
    - Class variables vs. instance variables
    - Inheritance (super())
    - Simple use of __str__()

Practice:

- Read a file with student records and create Student objects
- Extend the Student class into MLStudent class that adds model_score method
- Catch file read errors gracefully