Python End-to-End Roadmap

30-Day Plan

Complete plan

📅 Week 1: Python Fundamentals

Day 1: Introduction to Python

- What is Python?
- Why Python for Data Analysis?
- Installing Python, Jupyter Notebook, VS Code
- Hello World Program

Day 2: Variables and Data Types

- Variables and Naming Rules
- Basic Data Types: int, float, str, bool
- Type Casting/Type Conversion

Day 3: Strings and String Operations

- Creating Strings
- String Indexing and Slicing
- String Methods (upper(), lower(), split(), join())
- f-strings (Formatted Strings)

Day 4: Numbers and Arithmetic Operations

- Integers vs. Floats
- Arithmetic Operators (+, -, *, /, %, **)
- Order of Operations (PEMDAS)

Day 5: Lists

- Creating Lists
- List Indexing and Slicing

- List Methods (append, remove, sort, reverse)

Day 6: Tuples, Sets, Dictionaries

- Tuples (Immutable Lists)
- Sets (Unique Collections)
- Dictionaries (Key-Value Pairs)

Day 7: Conditional Statements

- if, elif, else Statements
- Logical Operators (and, or, not)
- Nested Conditions

📅 Week 2: Core Programming Concepts

Day 8: Loops

- for Loop
- while Loop
- Loop Control Statements (break, continue)

Day 9: Functions

- Defining Functions
- Function Parameters and Return Values
- Default Arguments

Day 10: Lambda Functions, map(), filter()

- Anonymous (lambda) Functions
- Using map() with lists

- Using filter() with conditions

Day 11: Error Handling

- try and except Blocks
- finally Block
- Raising Exceptions

Day 12: File Handling

- Opening Files (open())
- Reading and Writing Files
- Working with CSV files (basic)

Day 13: List Comprehensions

- Traditional Loops vs. List Comprehension
- Conditional List Comprehensions

Day 14: Practice Day

- Mini project: Build a Sales Calculator

📅 Week 3: Essential Libraries for Data Analysis

Day 15: Introduction to NumPy

- What is NumPy?
- Creating Arrays
- Array Math Operations

Day 16: NumPy Advanced Topics

- Indexing and Slicing Arrays
- Array Reshaping
- Aggregations (sum, mean, max)

Day 17: Introduction to Pandas

- What is Pandas?
- Creating DataFrames and Series
- Reading CSV Files

Day 18: Data Manipulation with Pandas

- Filtering Rows
- Sorting Data
- GroupBy Operations (sum, mean, count)

Day 19: Handling Missing Data

- Detecting Missing Values (isnull)
- Dropping or Filling Missing Values
- Merging and Joining Datasets

Day 20: Introduction to Matplotlib

- Line Plots
- Bar Charts
- Customizing Graphs (labels, title)

Day 21: Introduction to Seaborn

- Creating a Heatmap
- Scatterplots

- Pairplots and Distributions

📅 Week 4: Real Projects + Advanced Topics

Day 22: Data Cleaning Project

- Handling Duplicates
- Handling Missing Values
- Converting Data Types (e.g., string to datetime)

Day 23: Exploratory Data Analysis (EDA)

- Univariate Analysis
- Bivariate Analysis
- Correlation Analysis

Day 24: Start Project 1: CSV Dataset Analysis

- Load Data
- Basic Cleaning
- Initial Observations

Day 25: Continue Project 1: Visualization

- Plot Trends Over Time
- Top 5/Bottom 5 Analysis
- Save Plots

Day 26: SQL with Python (SQLite3)

- Introduction to SQL
- Connecting Python with SQLite3

- Running SELECT Queries

Day 27: Working with APIs

- What are APIs?
- Fetching Data using requests library
- Parsing JSON Data

Day 28: Basic Web Scraping (Optional)

- Introduction to BeautifulSoup
- Scraping Titles and Prices from a Website

Day 29: Final Portfolio Project

- Complete a Full EDA Report
- Prepare Project for GitHub

Day 30: Review and Portfolio Building

- Push Projects to GitHub
- Write Short Project Summaries
- Plan Your Next Learning Steps (SQL, PowerBI, etc.)

Free python Course with Certificates:
https://www.scaler.com/topics/course/python-sql-data-science/

Thank you!