🌀 Python for Data Science – Full Roadmap (Short Version)

💙 1. Python Fundamentals

- Introduction to Python

- Variables & Data Types (int, float, str, bool)

- Type Casting

- Input / Output (input(), print())

- Comments & Indentation

- Operators (Arithmetic, Comparison, Logical, Assignment)

💙 2. Control Flow

- if, elif, else

- Nested Conditions

- Loops: for, while

- break, continue, pass

- List Comprehension

💜 3. Data Structures

- **List** → indexing, slicing, append, remove, sort

- **Tuple** → immutable sequences

- **Set** → unique items

- **Dictionary** → key-value pairs (dict, keys(), values())

- **String Operations** → slicing, split(), join(), replace()

💚 4. Functions

- Defining functions (def)

- Arguments & Return values

- Default arguments

- *args & **kwargs

- Lambda Functions

💛 **5. File Handling**

- open(), read(), write(), close()

- Reading text & CSV files

- Exception Handling (try, except, finally)

🧠 **6. Object-Oriented Programming (OOP)**

- Class & Object

- Constructor (__init__)

- Inheritance

- Polymorphism

- Encapsulation

- Method Overriding

🧩 **7. Python Modules & Packages**

- Importing modules (import, from)

- math, random, datetime, os, sys

- Create your own module

- Virtual Environment (venv)

- Installing external libraries using pip

🧡 **8. Data Science Libraries**

- **NumPy** → arrays, mathematical operations

- **Pandas** → data cleaning, manipulation, analysis

- **Matplotlib / Seaborn** → data visualization

- **Scikit-learn** → machine learning algorithms