Python Network Programming Roadmap (Beginner to Advanced)

This roadmap is designed to take you from a complete beginner in networking to being capable of building networked applications using Python. It includes theoretical concepts, hands-on coding tasks, exercises, and mini-projects over 4 weeks.

Week 1: Network Basics + Python Sockets (TCP/UDP)

- Day 1: What is Networking? (IP, Port, Protocols, LAN/WAN)
- Day 2: Python socket module basics (TCP vs UDP)
- Day 3: Simple TCP Client and Server (1:1 messaging)
- Day 4: Bi-directional TCP Chat Application
- Day 5: UDP Client and Server Communication
- Day 6: Localhost Testing and Network Tools
- Day 7: Mini-Project 1 – Local Chat Room

Week 2: Multi-Client, Threads, File Transfer

- Day 8: Multi-threaded Server (Handle Multiple Clients)
- Day 9: File Transfer using TCP (text/image files)
- Day 10: Custom Protocol Design (JSON messages)
- Day 11: Broadcast Server to Multiple Clients
- Day 12–13: Mini-Project 2 – File Transfer Application

Week 3: Web and APIs

- Day 14: Introduction to HTTP and REST APIs
- Day 15: Using Python requests Module
- Day 16: Build API Client CLI App (e.g., Weather Info)
- Day 17: Create HTTP Server using http.server / Flask
- Day 18–20: Mini-Project 3 – API Caller GUI (Tkinter/Streamlit)

Week 4: Socket Security, Real-Time Messaging

- Day 21: Error Handling and Timeout in Sockets
- Day 22: Socket Security Concepts
- Day 23–24: Mini-Project 4 – Real-Time Messenger App
- Day 25–27: Final Project – Choose your idea (Chat App, Remote Shell, File Sharing, Quiz Game, Weather Broadcast)
- Day 28: Review and Final Submission