Net Cafe Bandwidth Simulator

Overview

This project is a C++ simulation that models how bandwidth can be dynamically allocated among multiple clients in an Internet café or shared network environment. The simulator manages client connections, session durations, and proportionally distributes available bandwidth based on demand, ensuring fair allocation when network load exceeds capacity.

Technologies Used

- **Language:** C++ (OOP Concepts: Classes, Structs, Vectors)
- **Concepts:** Simulation, Resource Allocation, Data Structures

How It Works

1. The user inputs the number of clients to connect.
2. For each client:
    - Enter requested bandwidth (Mbps)
    - Enter session duration (minutes)
3. The simulation runs minute-by-minute, allocating bandwidth dynamically:
    - If total demand ≤ available bandwidth, all clients get their requested bandwidth.
    - If total demand > available bandwidth, bandwidth is scaled proportionally.
4. Clients automatically disconnect when their session time ends.
5. The simulation ends when no clients remain connected.

BY: SUSHANT MORE

Sample Output

Enter number of clients to connect (max allowed: 10): 3

Client 1 - Enter requested bandwidth (Mbps): 50

Client 1 - Enter session time (minutes): 5

Client 2 - Enter requested bandwidth (Mbps): 30

Client 2 - Enter session time (minutes): 4

Client 3 - Enter requested bandwidth (Mbps): 60

Client 3 - Enter session time (minutes): 3

----- Simulating 1 minute -----

Client 1 - Allocated: 41.66 Mbps, Remaining Time: 4 minutes

Client 2 - Allocated: 25 Mbps, Remaining Time: 3 minutes

Client 3 - Allocated: 33.33 Mbps, Remaining Time: 2 minutes
