PROJECT REPORT

Real-Time Stock Market Updates

1. Introduction

Objective:

The primary objective of this project is to design and implement a real-time stock market application utilizing Java socket programming. The system demonstrates key networking concepts and ensures seamless interaction between clients and a centralized server. The project emphasizes reliability, scalability, and user-friendliness.

Tools Used:

- **Programming Language:** Java (Socket Programming and Swing for GUI Development).
- **Networking Protocol:** TCP/IP for reliable communication.
- **Development Environment:** NetBeans.
- **Libraries:** Java Swing for GUI, Java Utilities for multithreading, and I/O streams for data exchange.

Networking Concepts Covered:

- Client-server architecture for real-time communication.
- TCP protocol for secure and reliable data transmission.
- Multithreading for handling concurrent users efficiently.
- Authentication mechanisms to ensure secure access.

2. Network Design

2.1 Architecture:

The system is based on a client-server architecture:

a) Server Component:

- Handles client connections, user authentication, user data, and stock updates.
- Uses multithreading (`Executor Service`) to serve multiple clients concurrently.
- Simulates real-time stock prices by generating random updates.

b) Client Component:

- Provides a graphical user interface (GUI) for user interaction.
- Supports login, registration, stock subscription, and live updates of stocks.
- Maintains a local list of subscribed stocks for personalized updates.

2.3 Logical Flow:

1. Authentication: Clients log in or register with the server.

2. Stock Data Request: Clients request live stock data updates.

3.Subscription: Users subscribe to specific stocks, with the server tracking these preferences.

4. Data Updates: The server streams stock updates, filtering data for subscribed stocks as needed.

Flowchart Diagram