Project Report

Group No. 5

Multithreaded Quiz System

Project Overview:

Our project is an online quizzing system designed to facilitate interactive learning. It features a server-client architecture, allowing multiple clients to connect simultaneously from different devices. The server initiates the quiz by taking input of the question from the QuizMaster and then sending it to the subserver which in turn sends it to all the clients. This is followed by an exchange of messages between the server, subserver and client(s) till all the client process(es) terminate(s) and results generated. This system offers an engaging quizzing experience for users.

Individual Contribution:

Name	Enrollment No.	Contribution
Gujar Neha Pankaj	21114039	Server code, Walsh Table Construction/ SetUp, Subserver code(client_server function)
Mehak Sharma	21114060	Client code, Subserver code (main function), Encode function of CDMA
Nishita Singh	21114068	Server code, Decoding of CDMA using Walsh Table, Subserver code(client_server function)
Manashree Kalode	21114057	Client code, Subserver code (main function), Pthread Implementation logic

All Team members have equally contributed in the ideation, coding, debugging of the code and documentation.

Important Concepts :

In the development of our multithreaded quiz system, we have leveraged a combination of CDMA (Code Division Multiple Access) technology, Pthreads (POSIX threads), and TCP socket programming.

1. TCP Socket Programming : Our implementation of TCP socket programming ensures reliable and orderly data transfer over the network. This integrated approach has resulted in a scalable and high-performance quiz system that is capable of handling a large number of concurrent users while maintaining the integrity and security of the quiz data.

2. CDMA Implementation : CDMA allows us to achieve concurrent and secure communication between multiple clients and the server, ensuring data integrity and minimizing the risk of interference. It has been implemented through separate functions for SetUp of Walsh Table, Encoding the data using the codes from Walsh table, and Decoding the data sent at the Server using channel sequences from the Walsh table.

3. Pthreads : The use of Pthreads enables parallel processing, improving system responsiveness and resource utilization, as multiple threads handle user requests simultaneously. Pthreads is used in subserver to handle interactions with individual clients as well as server concurrently.

Project Flow:

1. Initialization: Server connects to the Subserver. Subserver connects to the Client.
2. Message Transfer: Question is sent from Server to Subserver, then from Subserver to Clients.
3. Response Phase: Clients send their responses to the Subserver, which are further passed on to the Server.
4. Evaluation: Client responses(through Subserver) are checked for correctness and the final result is written into a text file.