**CLIENT SERVER APPLICATION USING SOCKET [ CLASS THE HELPS IN CLIENT SERVER ARCHITECTURE]**

**JAVA a4**

**IP ADDRESS a9**

**DATA STREAMS I/O [FULL DUPLEX COMMUNICATION] i/o**

**THREADING [MULTITASKING FOR MULTIPLE CLIENTS FCFS]**

**CREATIVE GUI**

**THIS JAVA PROGRAM IS A GUI-BASED CHAT CLIENT THAT CONNECTS TO A SERVER USING SOCKETS. USERS ENTER A USERNAME, AND THE CLIENT DISPLAYS A CHAT INTERFACE. IT CONTINUOUSLY LISTENS FOR MESSAGES FROM THE SERVER AND ALLOWS USERS TO SEND MESSAGES. THE GUI IS VISUALLY CUSTOMIZED, AND THE PROGRAM IS DESIGNED WITH SWING COMPONENTS AND MULTITHREADING.**

**SERVER  
THIS JAVA PROGRAM IS A SIMPLE CHAT SERVER THAT LISTENS FOR CLIENT CONNECTIONS ON A SPECIFIED PORT. IT USES MULTITHREADING TO HANDLE MULTIPLE CLIENTS CONCURRENTLY. THE SERVER KEEPS TRACK OF CONNECTED CLIENTS USING A HASHMAP. EACH CLIENT CONNECTION IS MANAGED BY A SERVERHANDLER THREAD. THE SERVER CAN ADD, REMOVE CLIENTS, AND BROADCAST MESSAGES TO ALL CONNECTED CLIENTS. THE SERVER'S STATUS AND CLIENT CONNECTIONS ARE DISPLAYED IN A GUI PROVIDED BY THE CHATSERVERGUI CLASS. THE PROGRAM INITIALIZES THE SERVER, GUI, AND STARTS THE SERVER THREAD UPON EXECUTION.**

**SERVER HANDLER**

**THIS JAVA CLASS, SERVERHANDLER, REPRESENTS A THREAD THAT MANAGES COMMUNICATION WITH AN INDIVIDUAL CLIENT ON THE SERVER SIDE. IT READS MESSAGES FROM THE CLIENT, BROADCASTS THEM TO ALL CONNECTED CLIENTS, AND HANDLES THE CLIENT'S DISCONNECTION. THE CLASS MAINTAINS A LINK TO THE CLIENT'S SOCKET, A PRINTWRITER FOR SENDING MESSAGES TO THE CLIENT, AND REFERENCES TO THE SERVER AND GUI COMPONENTS. THE RUN METHOD INITIALIZES THE CONNECTION, RETRIEVES THE CLIENT'S USERNAME, AND CONTINUOUSLY LISTENS FOR MESSAGES. UPON RECEIVING A MESSAGE, IT BROADCASTS IT TO ALL CLIENTS, AND IF THE CLIENT DISCONNECTS, IT REMOVES THE CLIENT FROM THE SERVER'S LIST. THE SENDMESSAGE METHOD ALLOWS THE SERVER TO SEND MESSAGES TO THE SPECIFIC CLIENT ASSOCIATED WITH THIS HANDLER.**