**EXPERIMENT 7**

**Aim :**

Implement simple Multithreaded Server to perform all Mathematics Operations Parallel in Java.

**Code :**

**Server Class : Server.java** file

import java.io.\*;

import java.net.\*;

//Server class

class Server {

    public static void main(String[] args)

    {

        ServerSocket server = null;

        try {

            //server is listening on port 1234

            server = new ServerSocket(1234);

            server.setReuseAddress(true);

            //running infinite loop for getting client request

            while (true) {

                //socket object to receive incoming client requests

                Socket client = server.accept();

                //displaying that new client is connected to server

                System.out.println("New client connected"

                                + client.getInetAddress()

                                        .getHostAddress());

                //create a new thread object

                ClientHandler clientSock

                    = new ClientHandler(client);

                //this thread will handle the client separately

                new Thread(clientSock).start();

            }

        }

        catch (IOException e) {

            e.printStackTrace();

        }

        finally {

            if (server != null) {

                try {

                    server.close();

                }

                catch (IOException e) {

                    e.printStackTrace();

                }

            }

        }

    }

    //ClientHandler class

    private static class ClientHandler implements Runnable {

        private final Socket clientSocket;

        //Constructor

        public ClientHandler(Socket socket)

        {

            this.clientSocket = socket;

        }

        public void run()

        {

            PrintWriter out = null;

            BufferedReader in = null;

            try {

                //get the outputstream of client

                out = new PrintWriter(

                    clientSocket.getOutputStream(), true);

                //get the inputstream of client

                in = new BufferedReader(

                    new InputStreamReader(

                        clientSocket.getInputStream()));

                String line;

                while ((line = in.readLine()) != null) {

                    String[] arr=line.split(" ");

                    int res=0,p,q;

                    p=Integer.parseInt(arr[1]);q=Integer.parseInt(arr[2]);

                    if(line.charAt(0)=='1') {

                        res=p+q;

                    }

                    if(line.charAt(0)=='2') {

                        res=p-q;

                    }

                    if(line.charAt(0)=='3') {

                        res=p\*q;

                    }

                    if(line.charAt(0)=='4') {

                        res=p/q;

                    }

                    String text="choice: "+String.valueOf(line.charAt(0))+"\nAnd the Numbers are "+p+" "+q;

                    //writing the received message from client

                    System.out.printf(

                        " Sent from the client: %s\n", text);

                    line=Integer.toString(res);

                    out.println(line);

                }

            }

            catch (IOException e) {

                e.printStackTrace();

            }

            finally {

                try {

                    if (out != null) {

                        out.close();

                    }

                    if (in != null) {

                        in.close();

                        clientSocket.close();

                    }

                }

                catch (IOException e) {

                    e.printStackTrace();

                }

            }

        }

    }

}

**Code :**

**Client Class : Client.java** file

import java.io.\*;

import java.net.\*;

import java.util.\*;

//Client class

class Client {

    //driver code

    public static void main(String[] args) {

//establish a connection by providing host and port number

        try (Socket socket = new Socket("localhost", 1234)) {

            //writing to server

     PrintWriter out = new PrintWriter(socket.getOutputStream(), true);

            //reading from server

      BufferedReader in = new BufferedReader(new InputStreamReader(

                    socket.getInputStream()));

            //object of scanner class

            Scanner sc = new Scanner(System.in);

            String line = null;

            while (!"exit".equalsIgnoreCase(line)) {

                //reading from user

                System.out.println("\nEnter Numbers: ");

                String a1,a2;

                a1=sc.nextLine();

                a2=sc.nextLine();

                System.out.println("1. Addition\n2. Subtraction\n3. Multiplication\n4. Division");

                String ch;

                System.out.println("\nEnter Choice: ");

                ch=sc.nextLine();

                line=ch+' '+a1+' '+a2;

                //sending the user input to server

                out.println(line);

                out.flush();

                //displaying server reply

       System.out.println("Server replied Result is: " + in.readLine());

}

            //closing the scanner object

            sc.close();

        }

        catch (IOException e) {

            e.printStackTrace();

        }

    }

}

**Output Screenshots :**





