Que.1

Class Client:

```
import java.awt.BorderLayout;
import java.awt.GridLayout;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.io.DataInputStream;
import java.io.DataOutputStream;
import java.io.IOException;
import java.net.Socket;

import javax.swing.JButton;
import javax.swing.JFrame;
import javax.swing.JLabel;
import javax.swing.JPanel;
import javax.swing.JScrollPane;
import javax.swing.JTextArea;
import javax.swing.JTextField;

	/**
	 *
	 * @author manthan
	 */
	@SuppressWarnings("serial")
	public class Client extends JFrame{
```

```
   // Text field for receiving loan amount Number of years annual rate
private JTextField jL = new JTextField();
private JTextField jLayer = new JTextField();
private JTextField JLayerRate = new JTextField();
// Text area to display total rate
private JTextArea jTextA = new JTextArea();
public static JButton jbtsubmit = new JButton("submit");
// IO streams
private DataOutputStream toServer;
private DataInputStream fromServer;



public static void main(String[] args) {
 new Client();
}

public Client() {
 // Panel p to hold the label and text field
 JPanel pone = new JPanel(new BorderLayout());
 pone.setLayout(new GridLayout(3,1));
 pone.add(new JLabel("loan amount"));
 pone.add(new JLabel("Number of Years"));
 pone.add(new JLabel("Annual Interest Rate"));
 JPanel ptwo = new JPanel(new BorderLayout());
 ptwo.setLayout(new GridLayout(3,1));
```

```
ptwo.add(jL);
ptwo.add(jLayer);
ptwo.add(JLayerRate);
JPanel pthree = new JPanel(new BorderLayout());
pthree.setLayout(new GridLayout(1,1));
pthree.add(jbtsubmit);
JPanel pfinal = new JPanel(new BorderLayout());
pfinal.setLayout(new GridLayout(1,1));
setLayout(new BorderLayout());
pfinal.add(pone);
pfinal.add(ptwo);
pfinal.add(pthree);
add(pfinal, BorderLayout.NORTH);
add(new JScrollPane(jTextA), BorderLayout.CENTER);

/*
JPanel p = new JPanel();
p.setLayout(new GridLayout(4,2));
p.add(new JLabel("loan amount"));
p.add(jL);
p.add(new JLabel("Number of Years"));
p.add(jLayer);
p.add(new JLabel("Annual Interest Rate"));
p.add(JLayerRate);
p.add(jbtsubmit);
```

```
setLayout(new BorderLayout());
add(p, BorderLayout.NORTH);
add(new JScrollPane(jTextA), BorderLayout.CENTER);

*/
setTitle("Client");
setSize(500, 300);
setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
setVisible(true); // It is necessary to show the frame here!

try {
 // Create a socket to connect to the server
 @SuppressWarnings("resource")
      Socket socket = new Socket("localhost", 8000);
 fromServer = new DataInputStream(socket.getInputStream());
 toServer = new DataOutputStream(socket.getOutputStream());
}
catch (IOException ex) {
 jTextA.append(ex.toString() + '\n');
}

jbtsubmit.addActionListener(new ActionListener() {

   @Override
   public void actionPerformed(ActionEvent ae) {
```

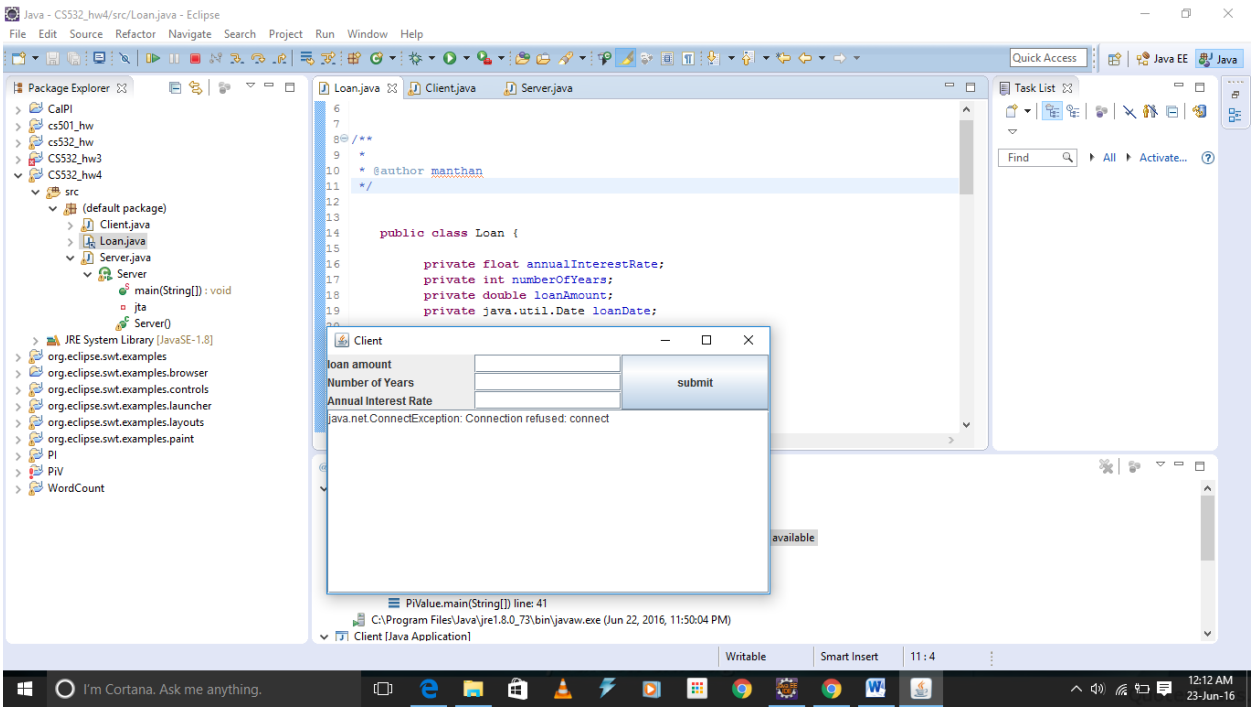
```
                try{
                   jTextA.append("Loan amount"+jL.getText()+ "\n");
                   jTextA.append("Total number of year"+jLayer.getText()+ "\n");
                   jTextA.append("Annual Interest Rate"+JLayerRate.getText()+ "\n");
                   @SuppressWarnings("unused")
                                          Loan l = new
Loan(Float.parseFloat(JLayerRate.getText().trim()),Integer.parseInt(jLayer.getText().trim()),Double.par
seDouble((jL.getText().trim())));
                   toServer.writeDouble(Double.parseDouble(jL.getText().trim()));
                   toServer.writeInt(Integer.parseInt(jLayer.getText().trim()));
                   toServer.writeFloat(Float.parseFloat(JLayerRate.getText().trim()));
                   jTextA.append("Monthly payment" + String.valueOf(fromServer.readDouble()) +
"\n");
                   jTextA.append("Total payment" +String.valueOf(fromServer.readInt())+ "\n");
                }
                catch(Exception e)
                {
                   System.out.println(e);
                }
             }
           });
         }

}
```

Class Loan:

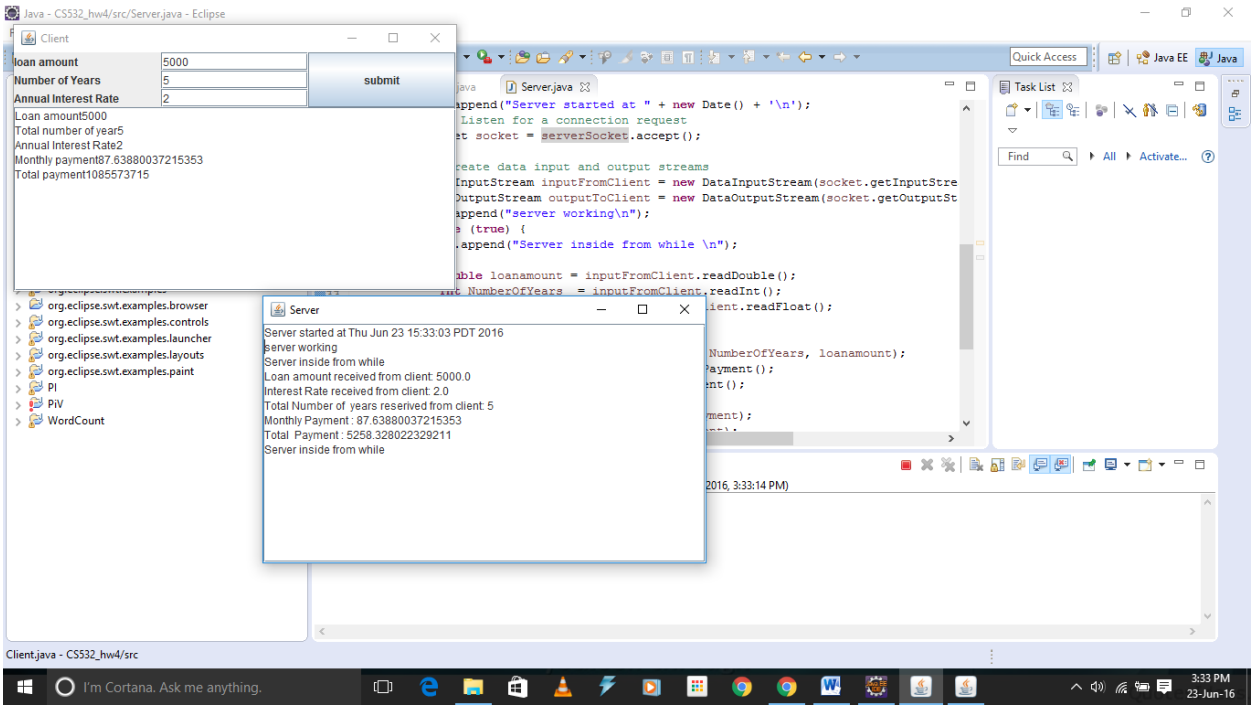
```
public class Loan {
        private float anIntR;
        private int NumYear;
        private double lAmount;
        private java.util.Date lDate;

        /** Default constructor */
        public Loan() {
          this.anIntR = (float)2.5;
          this.NumYear = 1;
          this.lAmount =1000;
        }

        /** Construct a loan with specified annual interest rate,
            number of years, and loan amount
          */
        public Loan(float anIntR, int NumYear,
            double lAmount) {
          this.anIntR = anIntR;
          this.NumYear = NumYear;
          this.lAmount = lAmount;
          lDate = new java.util.Date();
        }

        /** Return anIntR */
        public double getanIntR() {
          return anIntR;
        }

        /** Set a new anIntR */
        public void setanIntR(float anIntR) {
          this.anIntR = anIntR;
        }

        /** Return NumYear */
        public int getNumYear() {
          return NumYear;
        }

        /** Set a new NumYear */
        public void setNumYear(int NumYear) {
          this.NumYear = NumYear;
        }

        /** Return lAmount */
        public double getlAmount() {
          return lAmount;
        }

        /** Set a newlAmount */
        public void setlAmount(double lAmount) {
          this.lAmount = lAmount;
        }

        /** Find monthly payment */
        public double getMonthlyPayment() {
```

```
        double monthlyInterestRate = anIntR / 1200;
        double monthlyPayment = lAmount * monthlyInterestRate / (1 -
          (1 / Math.pow(1 + monthlyInterestRate, NumYear * 12)));
        return monthlyPayment;
      }

      /** Find total payment */
      public double getTotalPayment() {
        double totalPayment = getMonthlyPayment() * NumYear * 12;
        return totalPayment;
      }

      /** Return loan date */
      public java.util.Date getlDate() {
        return lDate;
      }



}
Class Server:
import java.io.*;

    import java.net.*;
    import java.util.*;
    import java.awt.*;
    import javax.swing.*;
@SuppressWarnings("serial")
public class Server extends JFrame {



      // Text area for displaying contents
      private JTextArea jTextA = new JTextArea();

      public static void main(String[] args) {
        new Server();
      }

      public Server() {
        // Place text area on the frame
        setLayout(new BorderLayout());
        add(new JScrollPane(jTextA), BorderLayout.CENTER);
        setTitle("Server");
        setSize(500, 300);
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setVisible(true); // It is necessary to show the frame here!

        try {
          // Create a server socket
          @SuppressWarnings("resource")
          ServerSocket serverSocket = new ServerSocket(8000);
          jTextA.append("Server started at " + new Date() + '\n');
            // Listen for a connection request
          Socket socket = serverSocket.accept();

          // Create data input and output streams
```

```
            DataInputStream inputFromClient = new
DataInputStream(socket.getInputStream());
            DataOutputStream outputToClient = new
DataOutputStream(socket.getOutputStream());
            jTextA.append("server working\n");
            while (true) {
             jTextA.append("Server inside from while \n");

              double loanamount = inputFromClient.readDouble();
              int NumberOfYears  = inputFromClient.readInt();
              float totalInterestRate = inputFromClient.readFloat();

              // Compute area
              Loan l = new Loan(totalInterestRate, NumberOfYears,
loanamount);
              double monthlyPayment = l.getMonthlyPayment();
              double totalPayment = l.getTotalPayment();
              // Send area back to the client
              outputToClient.writeDouble(monthlyPayment);
              outputToClient.writeDouble(totalPayment);
              jTextA.append("Loan amount received from client: "
+String.valueOf(loanamount)+'\n');
              jTextA.append("Interest Rate received from client: "
+String.valueOf(totalInterestRate) + '\n');
              jTextA.append("Total Number of  years reserived from client: "
+ String.valueOf(NumberOfYears) + '\n');
              jTextA.append("Monthly Payment : " +
String.valueOf(monthlyPayment) + '\n');
              jTextA.append("Total  Payment : " +
String.valueOf(totalPayment) + '\n');
            }
          }
          catch(IOException ex) {
            System.err.println(ex);
          }
        }
}
```



Total Details:



Que 2:

```
import java.awt.*;
import java.awt.event.*;
import java.io.*;
import java.net.*;
import javax.swing.*;

public class ChatClient extends JFrame implements Runnable
{
	private static final long serialVersionUID = 1L;
	private JTextField name = new JTextField("Enter a name");
	private JTextField text = new JTextField();
	private JTextArea clientTextArea = new JTextArea();

	private Socket socket;
	private DataOutputStream dataout;
	private DataInputStream datain;

	//main
	public static void main(String[] args) {
	   new ChatClient();
	}
	//Constructor
```

```
public ChatClient() {

    JPanel panel1 = new JPanel();
    panel1.setLayout(new BorderLayout());
    panel1.add(new JLabel("Enter text"), BorderLayout.WEST);
    panel1.add(text, BorderLayout.CENTER);

    JPanel panel2 = new JPanel();
    panel2.setLayout(new BorderLayout());
    panel2.add(new JLabel("Name"), BorderLayout.WEST);
    panel2.add(name, BorderLayout.CENTER);

    JPanel panel = new JPanel();
    panel.setLayout(new BorderLayout());
    panel.add(panel1, BorderLayout.SOUTH);
    panel.add(panel2, BorderLayout.NORTH);

    setLayout(new BorderLayout());
    add(panel, BorderLayout.NORTH);
    add(new JScrollPane(clientTextArea), BorderLayout.CENTER);
    clientTextArea.setEditable(false);
    text.addActionListener(new ButtonClickListener());

    setTitle("Multi Chat Client");
    setSize(500,300);
```

```
        setLocationRelativeTo(null);
        setLocation(1200,400);
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setVisible(true);

      try {
          socket = new Socket("localhost", 8000);
          datain = new DataInputStream(socket.getInputStream());
          dataout = new DataOutputStream(socket.getOutputStream());
          new Thread(this).start();
        }catch(IOException ex) {
          clientTextArea.append(ex.toString() + "\n");
        }
    }

    private class ButtonClickListener implements ActionListener {
      @Override
      public void actionPerformed(ActionEvent e) {
        try{
            String data = name.getText().trim() + ": " + text.getText().trim(); //Get the text from the
text field
            dataout.writeUTF(data); // Send the text to the server
            text.setText("");
          }catch (IOException ex){
            System.err.println(ex);
        }
```

```
      }
    }

    public void run(){
      try{
          while(true){
            String text1 = datain.readUTF(); // Get message
            clientTextArea.append(text1 + "\n"); //Display to the text area
          }
    }catch(IOException ex){
      System.err.println(ex);
    }
  }
}
```

```
import java.awt.*;
import java.io.*;
import java.net.*;
import java.util.*;
import javax.swing.*;

public class ChatServer extends JFrame{
      private static final long serialVersionUID = 1L;

        //Text area for displaying contents
        private JTextArea serverTextArea = new JTextArea();
        private Hashtable<Socket, DataOutputStream> Streams = new
Hashtable<Socket, DataOutputStream>();
        private ServerSocket serverSocket; //Server socket

        //main
        public static void main(String[] args) {
            new ChatServer();
        }
        //Constructor
        public ChatServer() {
            //Place text area on the frame
            setLayout(new BorderLayout());
            add(new JScrollPane(serverTextArea), BorderLayout.CENTER);
```

```
            setTitle("Multi Chat Server");
            setSize(650, 300);
            setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
            setVisible(true);
            setLocation(1150,100);
            serverTextArea.setEditable(false);
            listen();
        }

        private void listen() {
            try {
                    serverSocket = new ServerSocket(8000); // Create a server
socket
                    serverTextArea.append("Multi Thread Server started at " +
new Date() + '\n');

                    while (true){
                        Socket socket = serverSocket.accept(); //Listen for a
new connection request
                        serverTextArea.append("Connection from " + socket + "
at " + new Date() + '\n');
                        DataOutputStream dataout = new
DataOutputStream(socket.getOutputStream());
                        Streams.put(socket, dataout);
                        new ServerThread(this, socket);
                    }
                }
                catch(IOException ex) {
                    System.err.println(ex);
                }
        }

    //Used to get the output streams
    Enumeration<DataOutputStream> getOutputStreams(){
        return Streams.elements();
    }

    //Used to send message to all clients
    void sendToAll(String message){
      //Go through hashtable and send message to each output stream
      for(Enumeration<?> e = getOutputStreams(); e.hasMoreElements();)
      {
        DataOutputStream dout = (DataOutputStream)e.nextElement();
        try{
                dout.writeUTF(message); // Write message
            }catch (IOException ex){
              System.err.println(ex);
            }
        }
    }


  class ServerThread extends Thread {
        private ChatServer server;
        private Socket socket;
        public ServerThread(ChatServer server, Socket socket) {
          this.socket = socket;
```

```
            this.server = server;
            start();
        }
        public void run() {
            try {

                DataInputStream inputStream = new
DataInputStream(socket.getInputStream());
                while (true) {
                  String data = inputStream.readUTF();
                  server.sendToAll(data);
                  serverTextArea.append(data +"\n");
                }
            }catch(IOException e) {
              System.err.println(e);
            }
        }
    }
}
```