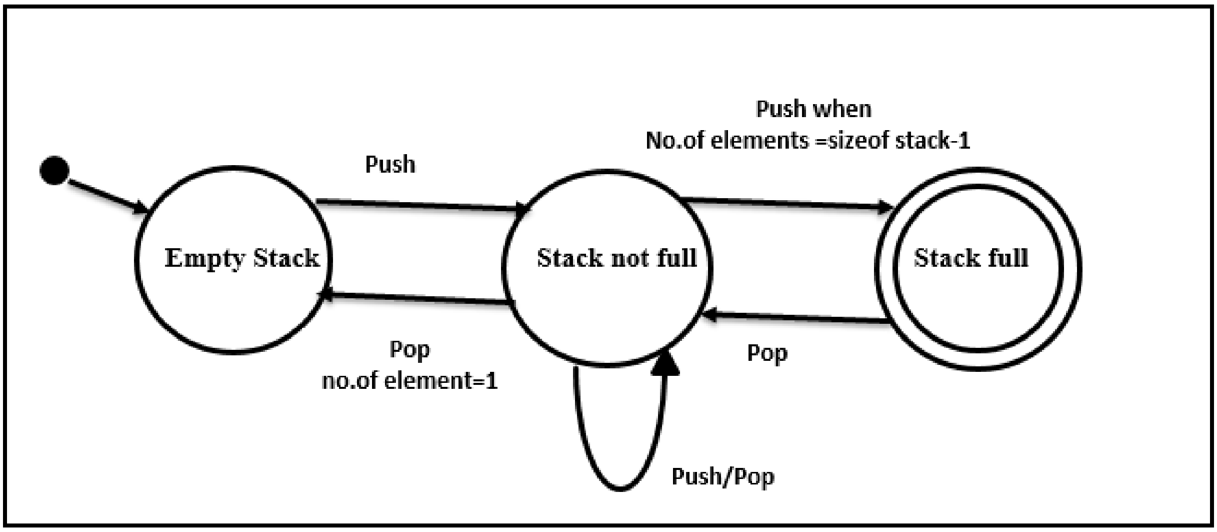
Termwork : 1

Problem Statement:

Using State Diagram Design and Describe the behaviour of STACK which contains maximum of FOUR integer elements. Implement the above design in JAVA Programming Language. Design the TEST-DRIVER class to include minimum
number of TEST CASES to test the complete features of STACK class designed.

Design Aspects/State Diagram:



Data Structure used:

Stack is implemented using array of fixed size.
Stack data structure provides the following operations:
Pop: Remove element from the stack. This operation can be operated on stack only if the stack is not empty. As stack data structure works as LIFO pop operations always pops the top of the stack.
Push: Used to add the element to the top of the stack. Push operation fails if the stack is full.
Display: Used to display the content of the stack.
isFull() : Used to check whether the stack is full or not. Push calls isFull() method before pushing the element into the stack.
isEmpty(): Used to check whether the stack is empty or not. Display and Pop methods call isEmpty() method before popping or displaying the elements.

In this termwork size of stack is set to to four as follows.

```
int stk_elements[]=new int[4];
```

Test Cases:

Test Case ID	Test Scenario	Test Case Input	Expected Output	Observed Output
Test Case: 1	Push operation when stack is empty	push(2)	Pushed successfully	Pushed successfully
Test Case: 2	Pop operation when stack is not empty	pop() i.e., pop the top of the stack	Popped successfully	Popped successfully
Test Case: 3	Display operation when stack is not empty	display() called	Elements are displayed	Elements are displayed
Test Case: 4	Push operation when stack is full	push(4)	Cannot Push the element	Push Failed Stack Full
Test Case: 5	Pop operation when stack is empty	pop() i.e., pop the top of the stack	No elements to pop	Pop failed
Test Case: 6	Display operation when stack is empty	display() called	No elements to display	Display failed

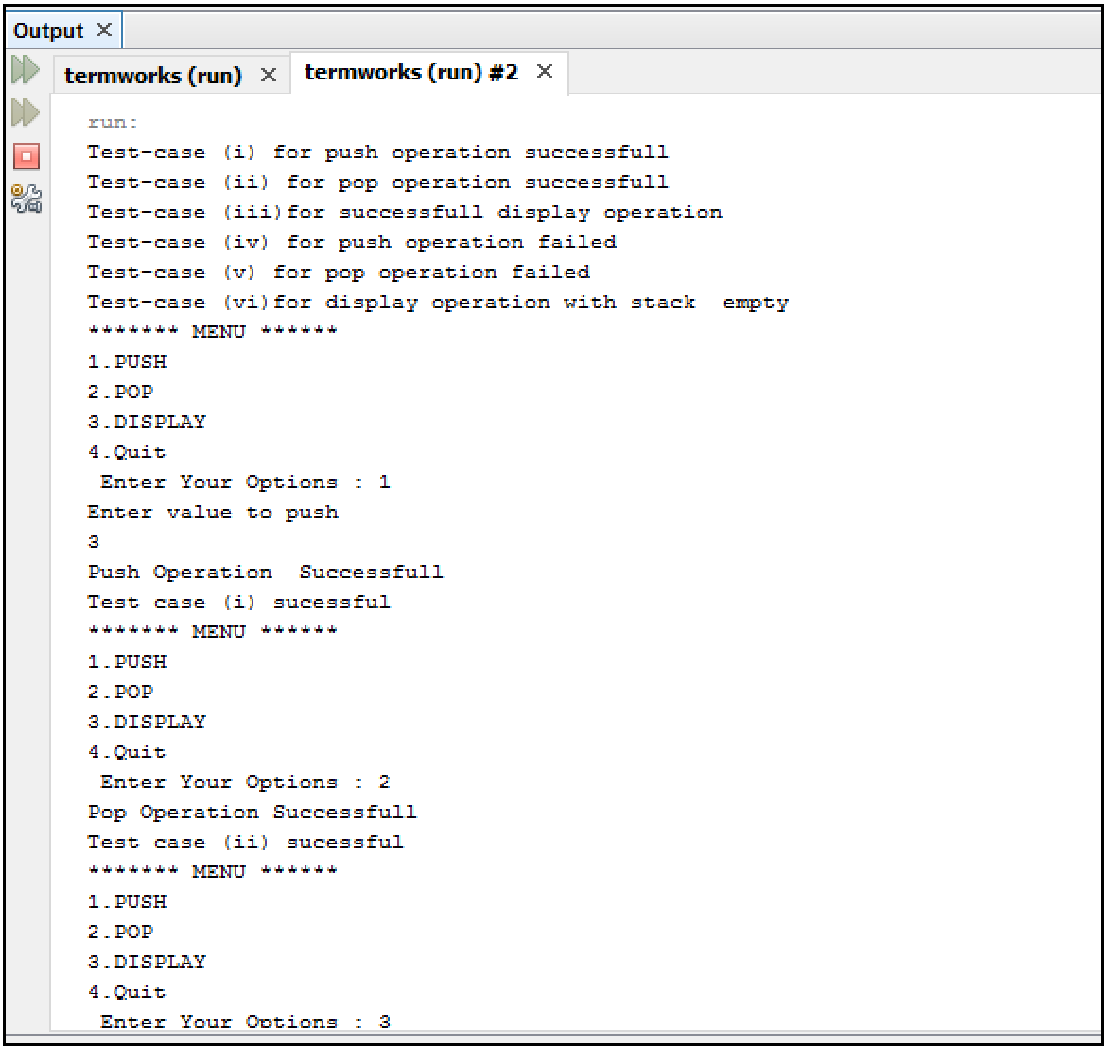
JAVA Code:

```
package termworks;

import java.util.Scanner;

class StackOperations
{
@SuppressWarnings("unused")
private    int  top=-1,x;
   int stk_elements[]=new int[4];
boolean isEmpty()
    {
          if(top==-1)
                 return(true);
          return(false);
    }

    boolean isFull()
    {
          if(top>=3)
                 return(true);
```

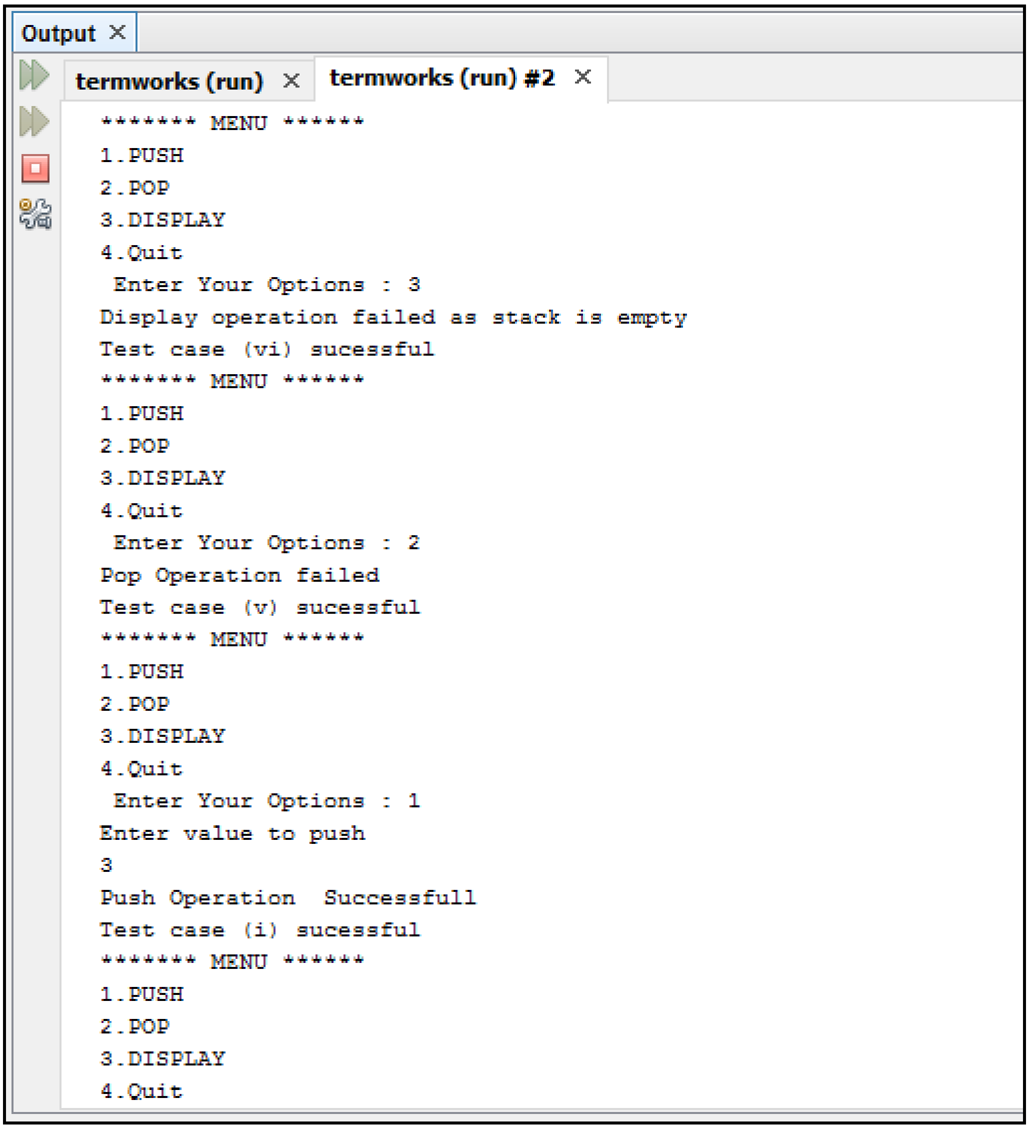
```
        return(false);
}

int push(int element)
{
        if(isFull())
        {

              return(4);
        }
        else if(top==0 && top<=3){
       stk_elements[++top]=element;
       return(1);

  }
        else
        {
              stk_elements[++top]=element;
               return(1);
        }

 }//push()
int pop()
{
        if(isEmpty())
        {

              return(5);
        }

        else
        {
              x=stk_elements[top--];
             return(2);

    }

}

int display(){
if(isEmpty())

           return(6);


else{
```

```
            System.out.println("Stack content");
                     for(int i=top;i>=0;i--){
                System.out.println(stk_elements[i]);

             }
   return(3);
    }


    }
}//display()

class TestDriver {
   public void checkTestCase(int status){
      switch(status){
      case 1:System.out.println("Test case (i) sucessful");
             break;
      case 2:System.out.println("Test case (ii) sucessful");
             break;
     case 3:System.out.println("Test case (iii) sucessful");
            break;
      case 4:System.out.println("Test case (iv) sucessful");
               break;
      case 5:System.out.println("Test case (v) sucessful");
               break;
      case 6:System.out.println("Test case (vi) sucessful");
               break;
       default:System.out.println("In valid test-case id");


      }
   }


}
public class UseOfStackOp{
public static void main(String args[])
{
StackOperations s=new StackOperations();
TestDriver td=new TestDriver();
 Scanner sc = new Scanner(System.in);
int choice,item,choice1;
System.out.println("Test-case (i) for push operation successfull");
System.out.println("Test-case (ii) for pop operation successfull");
System.out.println("Test-case (iii)for successfull display operation ");
System.out.println("Test-case (iv) for push operation failed");
System.out.println("Test-case (v) for pop operation failed");
System.out.println("Test-case (vi)for display operation with stack  empty ");
    do
            {

                System.out.println("******* MENU ******");
                System.out.println("1.PUSH");
                System.out.println("2.POP");
                System.out.println("3.DISPLAY");
                System.out.println("4.Quit");
                System.out.print(" Enter Your Options : ");
                choice=sc.nextInt();
               switch (choice) {
                  case 1:
                        System.out.println("Enter value to push");
                        item=sc.nextInt();
                        choice1=s.push(item);
                        switch(choice1){
                        case 1:System.out.println("Push Operation  Successfull");
                             td.checkTestCase(1);
                             break;
                        case 4:System.out.println("Push Operation failed");
                             td.checkTestCase(4);
                              break;
                         }
                   break;

                   case 2:

                      choice1= s.pop() ;
                      switch(choice1){
                      case 2:System.out.println("Pop Operation Successfull");
                           td.checkTestCase(2);
                           break;
                      case 5:System.out.println("Pop Operation failed");
                          td.checkTestCase(5);
                          break;

                      }
                  break;
                  case 3:
                    choice1=s.display();
                    switch(choice1){
                     case 3:System.out.println("Display Operation Successfull");
                         td.checkTestCase(3);
                         break;
                     case 6:System.out.println("Display operation failed as stack is empty");
                         td.checkTestCase(6);
                    break;

                 }
                break;

              case 4:  System.out.println("End of the program");
                   break;
              }
          }while(choice!=4);
      }
}
```

Output:



```
run:
Test-case (i) for push operation successfull
Test-case (ii) for pop operation successfull
Test-case (iii)for successfull display operation
Test-case (iv) for push operation failed
Test-case (v) for pop operation failed
Test-case (vi)for display operation with stack  empty
******* MENU ******
1.PUSH
2.POP
3.DISPLAY
4.Quit
 Enter Your Options : 1
Enter value to push
3
Push Operation  Successfull
Test case (i) sucessful
******* MENU ******
1.PUSH
2.POP
3.DISPLAY
4.Quit
 Enter Your Options : 2
Pop Operation Successfull
Test case (ii) sucessful
******* MENU ******
1.PUSH
2.POP
3.DISPLAY
4.Quit
 Enter Your Options : 3
```



```
******* MENU ******
1.PUSH
2.POP
3.DISPLAY
4.Quit
 Enter Your Options : 3
Display operation failed as stack is empty
Test case (vi) sucessful
******* MENU ******
1.PUSH
2.POP
3.DISPLAY
4.Quit
 Enter Your Options : 2
Pop Operation failed
Test case (v) sucessful
******* MENU ******
1.PUSH
2.POP
3.DISPLAY
4.Quit
 Enter Your Options : 1
Enter value to push
3
Push Operation  Successfull
Test case (i) sucessful
******* MENU ******
1.PUSH
2.POP
3.DISPLAY
4.Quit
```

Termwork : 2

Problem Statement:

Create an appropriate GUI which allows the user to select an item from the menu. When draw menu item is selected, draws the selected shape(Allowed shapes are: Circle, Rectangle & Triangle) in drawing area by getting appropriate dimensions of the selected shape from the user through key Board entry, using the concept of ABSTRACT CLASS, INHERITANCE and DYNAMIC DISPATCH features of JAVA Programming Language. Code must be robust for all possible erroneous input conditions, displaying appropriate error messages in message window specially designed for them.

Design Aspects:

An applet is a Java program that runs in a Web browser. An applet can be a fully functional Java application because it has the entire Java API at its disposal.

There are some important differences between an applet and a standalone Java application, including the following −

An applet is a Java class that extends the java.applet.Applet class.

A main() method is not invoked on an applet, and an applet class will not define main().

Applets are designed to be embedded within an HTML page.

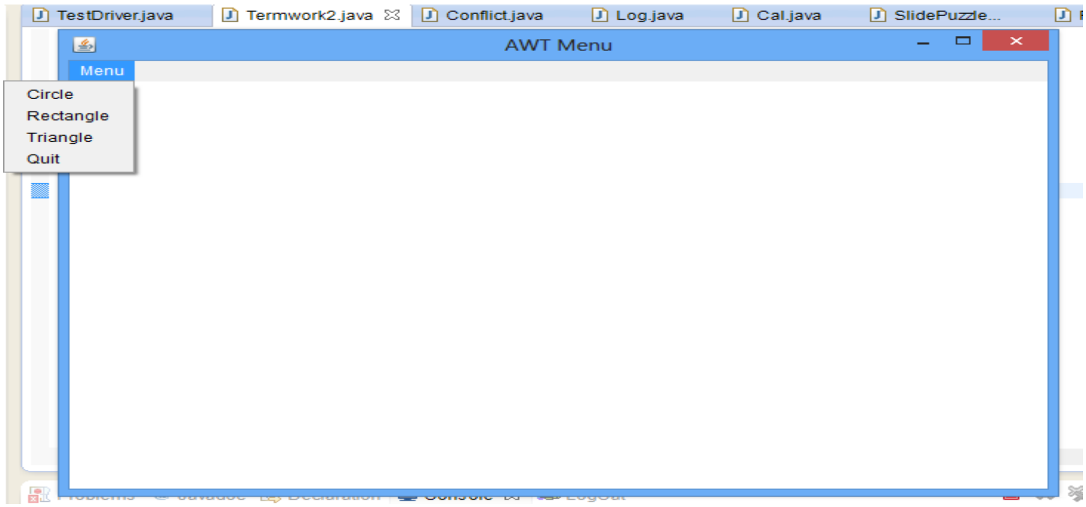
When a user views an HTML page that contains an applet, the code for the applet is downloaded to the user's machine.

A JVM is required to view an applet. The JVM can be either a plug-in of the Web browser or a separate runtime environment

Java code:

```
package termworks;
import java.awt.FlowLayout;
import java.awt.Frame;
import java.awt.Graphics;
import java.awt.Menu;
import java.awt.MenuBar;
import java.awt.MenuItem;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import javax.swing.JOptionPane;
import javax.swing.JPanel;
import javax.swing.JTextField;
public class Shapes extends Frame implements ActionListener {
MenuBar mbar;
Menu shapes;
MenuItem rect,tri,cir,q;
int x,y;
int xp[] = new int[2];
int yp[] = new int[2];
int zp[] = new int[2];
  public Shapes(){
   setTitle("Draw Shapes"); // Set the title
   setSize(400,400); // Set size to the frame
   setLayout(new FlowLayout()); // Set the layout
   setVisible(true); // Make the frame visible
   setLocationRelativeTo(null);  // Center the frame

   // Create the menu bar
   mbar=new MenuBar();
   // Create the menu
   shapes=new Menu("Shapes");

   // Create MenuItems
   cir=new MenuItem("Circle");
   rect=new MenuItem("Rectangle");
   tri=new MenuItem("Triangle");
   q=new MenuItem("Exit");

   // Attach menu items to menu
   shapes.add(cir);
   shapes.add(rect);
   shapes.add(tri);
   shapes.add(q);

   // Attach menu to menu bar
   mbar.add(shapes);

   // Set menu bar to the frame
   setMenuBar(mbar);

   //adding action listner
   cir.addActionListener(this);
   rect.addActionListener(this);
   tri.addActionListener(this);
   q.addActionListener(this);

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

   @Override
   public void actionPerformed(ActionEvent e) {
      Integer index=0;
		JPanel area = new JPanel();
		JTextField jt = new JTextField(5);
		JTextField jt1 = new JTextField(5);
	JTextField jt2 = new JTextField(5);
	JTextField jt3 = new JTextField(5);
	JTextField jt4 = new JTextField(5);
	JTextField jt5 = new JTextField(5);


		// TODO Auto-generated method stub
		String cmd=e.getActionCommand();
		if(cmd.equals("Circle"))
		{
			area.add(jt);
			index=2;
		}

		else if(cmd.equals("Rectangle"))
		{
			index=1;
			area.add(jt);
			area.add(jt1);
		}
		else if(cmd.equals("Triangle"))
		{
		    area.add(jt);
				area.add(jt1);
		        area.add(jt2);
				area.add(jt3);
		         area.add(jt4);
				area.add(jt5);
				index=3;
		}
	else if(cmd.equals("Exit"))
		{
			setVisible(false);
		}
		int result = JOptionPane.showConfirmDialog(null, area, "Enter the 
dimenisions", JOptionPane.OK_CANCEL_OPTION);
		if (result == JOptionPane.OK_OPTION && index==1) {
			x= Integer.parseInt(jt.getText());
			y= Integer.parseInt(jt1.getText());
		}
		else if (result == JOptionPane.OK_OPTION && index==2) {
			x= Integer.parseInt(jt.getText());
		}else if(result == JOptionPane.OK_OPTION && index==3){
        xp[0] = Integer.parseInt(jt.getText());
        xp[1] = Integer.parseInt(jt1.getText());
        yp[0] = Integer.parseInt(jt2.getText());
        yp[1] = Integer.parseInt(jt3.getText());
        zp[0] = Integer.parseInt(jt4.getText());
        zp[1] = Integer.parseInt(jt5.getText());
        }

                drawShape(index);

       }
       int flag=0;
       private void drawShape(Integer index) {
                // TODO Auto-generated method stub
                flag=index;
                repaint();
                }
       public void paint(Graphics g){
                //super.paint(g);
                switch (flag) {
                case 1:g.drawRect(100, 100, x,y);
        break;
                case 2:g.drawOval(100,100,x,x);
–       break;
                case 3:g.drawLine(xp[0],xp[1],yp[0],yp[1]);
         g.drawLine(yp[0],yp[1],zp[0],zp[1]);
         g.drawLine(zp[0],zp[1],xp[0],xp[1]);
                        break;
                }
      }
  }
```

Output:



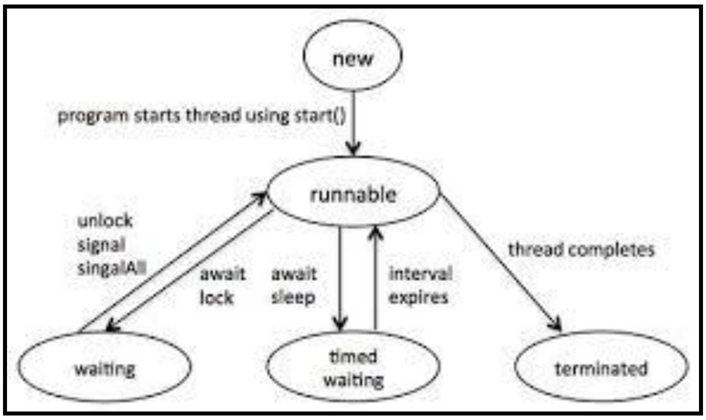
Termwork : 3

Problem Statement:

Write Java program to simulate LOST UPDATE or INCONSISTENT READ Transaction issues of database using MULTITHREADING features of JAVA and also Write java program to control the above concurrency issue. Output of the program to
be displayed on the screen as well as to be written in a file of user choice.

Design Aspects:

Java is a *multi-threaded programming language* which means we can develop multi-threaded program using Java. A multi-threaded program contains two or more parts that can run concurrently and each part can handle a different task at the same time making optimal use of the available resources specially when your computer has multiple CPUs. Thread works as follows.



Thread Synchronization:

Java programming language provides a very handy way of creating threads and synchronizing their task by using synchronized blocks. We mention shared resources within this block. Following is the general form of the synchronized statement −
Syntax

```
synchronized(objectidentifier) {
   // Access shared variables and other shared resources
}
```

Here, the objectidentifier is a reference to an object whose lock associates with the monitor that the synchronized statement represents.
To demonstrate the lost update problem synchronized block is not used. If there is no synchronization between the threads the update made by thread 1 one is lost as thread 2 overwrite the update made by thread1.

Without Synchronized:

Thread Scheduling	Update Made	Result	Expected Result

Thread :1	A=200;
	A=A+10;
		210	210

Thread:2	A=210
	A=A+20;
		220
		Update done to A=210 by
		Thread: 1 is lost.
		So Thread: 2 reads the value of A=200
			230

Java code:

```
package termworks;
import java.io.BufferedWriter;
import java.io.File;
import java.io.FileWriter;
import java.io.IOException;

class T1 extends Thread{
   public void run(){
   Term3.update(10);
   System.out.println("\nT1 thread Done");

   }
}
class T2 extends Thread{
   public void run(){
   Term3.update(20);
   System.out.println("\nT2 thread Done");

   }
}

public class Term3{
static int a=200;

   public static void main(String arg[]) throws IOException
   {
      File f=null;
      try{
         f=new
File("C:\\Users\\Acer\\Documents\\NetBeansProjects\\termworks\\src\\termworks\\out.d
at");
      }
      catch(Exception e){
         System.out.println("File not found");
      }
   //FileWriter fw=new FileWriter(f);

   T1 t1=new T1();
   T2 t2=new T2();
   t1.start();
   t2.start();
   try{
   t1.join();
   t2.join();
   }
   catch(InterruptedException e){}
   System.out.println("\nValue of a:"+a);
   BufferedWriter out1 = new BufferedWriter(new FileWriter(f));
     out1.write("\nValue of a:"+a);
     out1.close();
   //fw.write(" "+a);
   }

   static void update(int value){
   int x;
   x=a;
   try{
   Thread.sleep((int)(Math.random()*1));
   }catch(InterruptedException e){}
   x=x+value;
   try{
   Thread.sleep((int)(Math.random()*1));
   }catch(InterruptedException e){}
   a=x;
   }
}
```

With Synchronized:

Thread Scheduling	Update Made	Result	Expected Result

Thread :1	Input: A=200;
	A=A+10;
		210	210

Thread:2	Input: A=210 A=A+20;	230 Update done to A=210 by Thread:1 is retained. So Thread: 2 reads the value of A=210	230

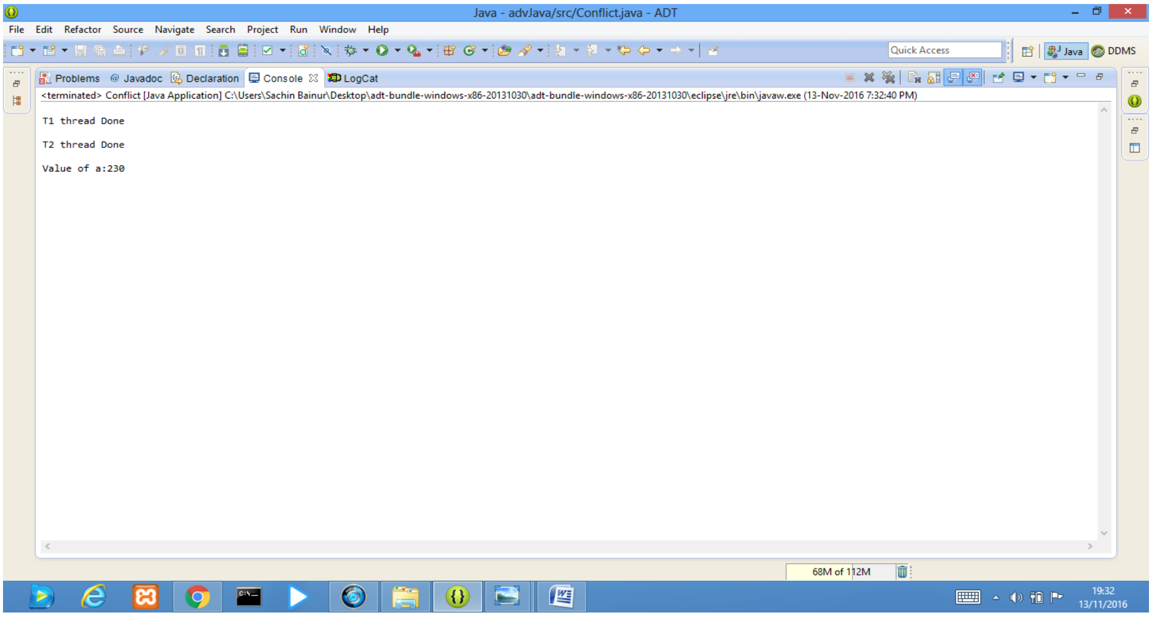
Java Code:

```
package termworks;
import java.io.BufferedWriter;
import java.io.File;
import java.io.FileWriter;
import java.io.IOException;
class Thread1 extends Thread{
   public void run(){
   Tw3.update(10);
   System.out.println("\nT1 thread Done");

   }
}


class Thread2 extends Thread{
   public void run(){
   Tw3.update(20);
   System.out.println("\nT2 thread Done");

   }
}

public class Tw3{
static int a=200;

   public static void main(String arg[]) throws IOException
   {
      File f=null;
      try{
         f=new
File("C:\\Users\\Acer\\Documents\\NetBeansProjects\\termworks\\src\\termworks\\out.d
at");
      }
      catch(Exception e){
         System.out.println("File not found");
      }
   //FileWriter fw=new FileWriter(f);

   Thread1 t1=new Thread1();
   Thread2 t2=new Thread2();
   t1.start();
   t2.start();

   try{
   t1.join();
   t2.join();
```

```
  }
  catch(InterruptedException e){}
  System.out.println("\nValue of a:"+a);
  BufferedWriter out1 = new BufferedWriter(new FileWriter(f));
    out1.write("\nValue of a:"+a);
    out1.close();
  //fw.write(" "+a);
  }

  static synchronized void update(int value){
  int x;
  x=a;
  try{
  Thread.sleep((int)(Math.random()*1));
  }catch(InterruptedException e){}
  x=x+value;
  try{
  Thread.sleep((int)(Math.random()*1));
  }catch(InterruptedException e){}
  a=x;
  }
}
```

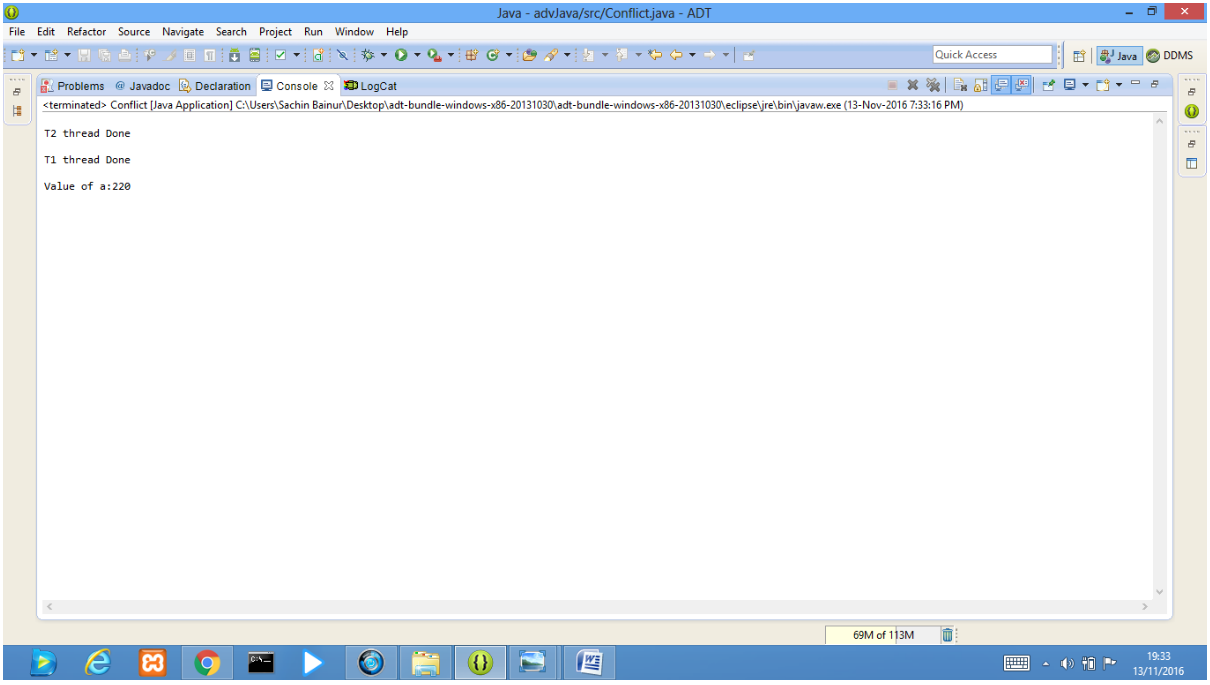
Output:

With Synchronisation:


Java - advJava/src/Conflict.java - ADT
File Edit Refactor Source Navigate Search Project Run Window Help
Quick Access
Java
DDMS
Problems
Javadoc
Declaration
Console
LogCat
68M of 112M
19:32
13/11/2016

```
<terminated> Conflict [Java Application] C:\Users\Sachin Bainur\Desktop\adt-bundle-windows-x86-20131030\adt-bundle-windows-x86-20131030\eclipse\jre\bin\javaw.exe (13-Nov-2016 7:32:40 PM)

T1 thread Done

T2 thread Done

Value of a:230
```

Without Synchronisation:


Java - advJava/src/Conflict.java - ADT
File Edit Refactor Source Navigate Search Project Run Window Help
Quick Access
Java
DDMS
Problems
Javadoc
Declaration
Console
LogCat
69M of 113M
19:33
13/11/2016

```
<terminated> Conflict [Java Application] C:\Users\Sachin Bainur\Desktop\adt-bundle-windows-x86-20131030\adt-bundle-windows-x86-20131030\eclipse\jre\bin\javaw.exe (13-Nov-2016 7:33:16 PM)

T2 thread Done

T1 thread Done

Value of a:220
```

Termwork : 4

Problem Statement:

Design and Implement an APPLET for any computer game of your choice. Store the user name and the score of each game session in the database (MySQL)

Java code:

```
//SlidePuzzle class
import java.awt.Button;
import java.awt.Color;
import java.awt.Dimension;
import java.awt.Frame;
import java.awt.Label;
import java.awt.TextField;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.awt.event.WindowAdapter;
import java.awt.event.WindowEvent;
@SuppressWarnings("serial")
public class SlidePuzzle extends Frame implements ActionListener
{ Label l1=new Label("User Name:");
  Label l2=new Label("Password:");
  Label l3=new Label("*Enter login details");
  Label l4=new Label("*Arrange the grid in asscending order starting from ONE");
  Label l5=new Label("*Complete the task in minimum time");
  Label l6=new Label(" ");
  TextField t1=new TextField();
  TextField t2=new TextField();
  Button b= new Button("Submit");
  //Image tImage = new ImageIcon("login.png").getImage();
  public SlidePuzzle()
  {
             setBackground(Color.GRAY);
           add(l1);
    add(t1);
    add(l2);
    add(t2);
    add(b);
    add(l3);
    add(l4);
    add(l5);
    add(l6);
  l1.setBounds(20,45,70,20);
  t1.setBounds(180,45,200,20);
  l2.setBounds(20,95,70,20);
  t2.setBounds(180,95,200,20);
  b.setBounds(310,145,70,20);
  l3.setBounds(20,200,200,20);
  l4.setBounds(20,220,400,20);
   l5.setBounds(20,240,400,20);
  b.addActionListener(this);
  t2.setEchoChar('*');
  addWindowListener(new mwa());
 }
 public void actionPerformed(ActionEvent e)
 {
        if(e.getSource()==b && t1.getText().compareTo("")!=0){
       // l3.setText("Welcome "+t1.getText());
               // setVisible(false);
   Puzzle p =new Puzzle();
        p.setUser(t1.getText(), t2.getText());
        p.setTitle("Welcome "+t1.getText());
        t1.setText("");
        t2.setText("");

        }

 }


 public static void main(String s[])
 { SlidePuzzle l=new SlidePuzzle();
  l.setSize(new Dimension(600,600));
  l.setTitle("Login");
  l.setVisible(true);
 }
}
class mwa extends WindowAdapter
{ public mwa(){}
 public void windowClosing(WindowEvent e)
 { System.exit(0);
 }
}
```

//Puzzle class

```
import java.awt.Button;
import java.awt.Frame;
import java.awt.Graphics;
import java.awt.GridLayout;
import java.awt.Image;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.Statement;
import java.util.Calendar;
import java.util.Date;
import java.util.GregorianCalendar;

import javax.swing.ImageIcon;
import javax.swing.JOptionPane;

@SuppressWarnings("serial")
public class Puzzle extends Frame implements ActionListener{
Button b1,b2,b3,b4,b5,b6,b7,b8,b9,x,y;
String u,pwd,ontime,offtime;
int sthr,stmin,stsec,edhr,edmin,edsec;
Image tileImage = new ImageIcon("bck.jpg").getImage();

String url = "jdbc:mysql://localhost:3306/";
String user = "root";
String password = "";


void setUser(String u, String p)
{
        this.u=u;
        pwd=p;
        //For login session
        Date d=new Date();
        ontime=d.toString();
}
public void paint(Graphics g){
        g.drawImage(tileImage, 0, 0, this);
}
Puzzle(){

        //for game session
                GregorianCalendar date = new GregorianCalendar();
                stsec = date.get(Calendar.SECOND);
          stmin = date.get(Calendar.MINUTE);
          sthr = date.get(Calendar.HOUR);
          setResizable(false);
          setLayout(new  GridLayout(4,3));
```

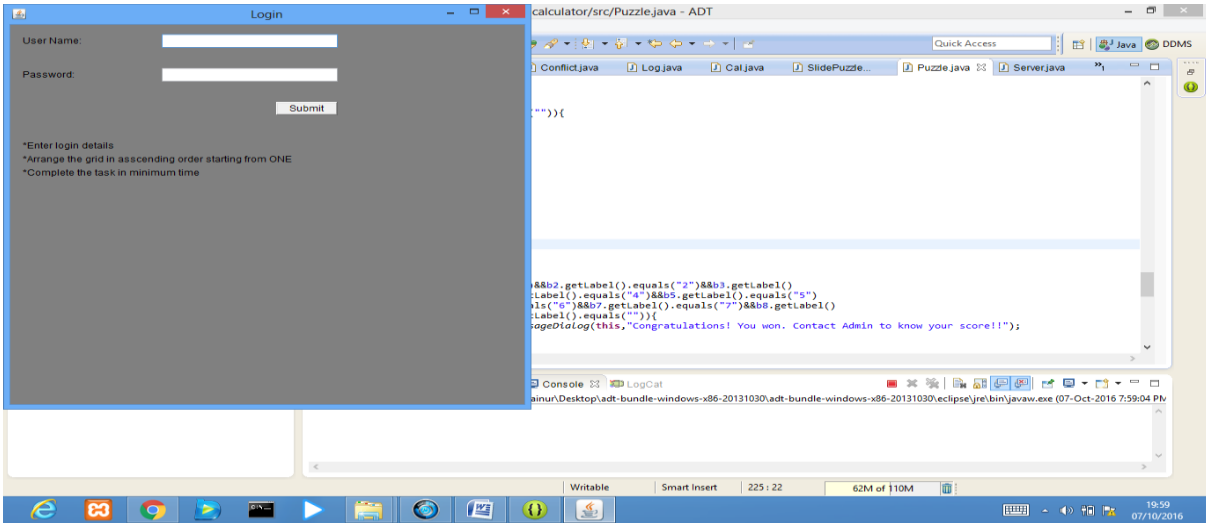
```
  // super("Puzzle - JavaTpoint");
   b1=new Button("7");
   b1.setBounds(50,100,40,40);
   b2=new Button("2");
   b2.setBounds(100,100,40,40);
   b3=new Button("3");
   b3.setBounds(150,100,40,40);
   b4=new Button("4");
   b4.setBounds(50,150,40,40);
   b5=new Button("");
   b5.setBounds(100,150,40,40);
   b6=new Button("6");
   b6.setBounds(150,150,40,40);
   b7=new Button("1");
   b7.setBounds(50,200,40,40);
   b8=new Button("5");
   b8.setBounds(100,200,40,40);
   b9=new Button("8");
   b9.setBounds(150,200,40,40);
   x=new Button("Exit");
   x.setBounds(300, 100, 50, 30);
   y=new Button("Reset");
   y.setBounds(200, 100, 70, 30);

   b1.addActionListener(this);
   b2.addActionListener(this);
   b3.addActionListener(this);
   b4.addActionListener(this);
   b5.addActionListener(this);
   b6.addActionListener(this);
   b7.addActionListener(this);
   b8.addActionListener(this);
   b9.addActionListener(this);
   x.addActionListener(this);
   y.addActionListener(this);

   add(b1);add(b2);add(b3);add(b4);add(b5);add(b6);add(b7);add(b8);add(b9); add(x)
;add(y);
   setSize(400,350);
   //setLayout(null);
   setVisible(true);
}
public void actionPerformed(ActionEvent e){
   if(e.getSource()==b1){
      String label=b1.getLabel();
      if(b2.getLabel().equals("")){
         b2.setLabel(label);
```

```
            b1.setLabel("");
        }
        if(b4.getLabel().equals("")){
            b4.setLabel(label);
            b1.setLabel("");
        }
    }
    if(e.getSource()==b2){
        String label=b2.getLabel();
        if(b1.getLabel().equals("")){
            b1.setLabel(label);
            b2.setLabel("");
        }
        if(b3.getLabel().equals("")){
            b3.setLabel(label);
            b2.setLabel("");
        }
        if(b5.getLabel().equals("")){
            b5.setLabel(label);
            b2.setLabel("");
        }
    }
    if(e.getSource()==b3){
        String label=b3.getLabel();
        if(b2.getLabel().equals("")){
            b2.setLabel(label);
            b3.setLabel("");
        }
        if(b6.getLabel().equals("")){
            b6.setLabel(label);
            b3.setLabel("");
        }
    }
    if(e.getSource()==b4){
        String label=b4.getLabel();
        if(b1.getLabel().equals("")){
            b1.setLabel(label);
            b4.setLabel("");
        }
        if(b7.getLabel().equals("")){
            b7.setLabel(label);
            b4.setLabel("");
        }
        if(b5.getLabel().equals("")){
            b5.setLabel(label);
            b4.setLabel("");
        }
```

```
   }
   if(e.getSource()==b5){
      String label=b5.getLabel();
      if(b2.getLabel().equals("")){
         b2.setLabel(label);
         b5.setLabel("");
      }
      if(b6.getLabel().equals("")){
         b6.setLabel(label);
         b5.setLabel("");
      }
      if(b4.getLabel().equals("")){
         b4.setLabel(label);
         b5.setLabel("");
      }
      if(b8.getLabel().equals("")){
         b8.setLabel(label);
         b5.setLabel("");
      }
   }
   if(e.getSource()==b6){
      String label=b6.getLabel();
      if(b9.getLabel().equals("")){
         b9.setLabel(label);
         b6.setLabel("");
      }
      if(b3.getLabel().equals("")){
         b3.setLabel(label);
         b6.setLabel("");
      }
      if(b5.getLabel().equals("")){
         b5.setLabel(label);
         b6.setLabel("");
      }
   }
   if(e.getSource()==b7){
      String label=b7.getLabel();
      if(b4.getLabel().equals("")){
         b4.setLabel(label);
         b7.setLabel("");
      }
      if(b8.getLabel().equals("")){
         b8.setLabel(label);
         b7.setLabel("");
      }
   }
   if(e.getSource()==b8){
        String label=b8.getLabel();
        if(b9.getLabel().equals("")){
           b9.setLabel(label);
           b8.setLabel("");
        }
        if(b7.getLabel().equals("")){
           b7.setLabel(label);
           b8.setLabel("");
        }
        if(b5.getLabel().equals("")){
           b5.setLabel(label);
           b8.setLabel("");
        }
     }
     if(e.getSource()==b9){
        String label=b9.getLabel();
        if(b6.getLabel().equals("")){
           b6.setLabel(label);
           b9.setLabel("");
        }
        if(b8.getLabel().equals("")){
           b8.setLabel(label);
           b9.setLabel("");
        }
     }
     if(e.getSource()==x){
           setVisible(false);
           Store(0);

     }
     if(e.getSource()==y)
           {
           setVisible(false);
           new Puzzle();
           }

     //congrats code
     if(b1.getLabel().equals("1")&&b2.getLabel().equals("2")&&b3.getLabel()
           .equals("3")&&b4.getLabel().equals("4")&&b5.getLabel().equals("5")
           &&b6.getLabel().equals("6")&&b7.getLabel().equals("7")&&b8.getLabel()
           .equals("8")&&b9.getLabel().equals("")){
           JOptionPane.showMessageDialog(this,"Congratulations! You won. Contact Admin to
know your score!!");

          //for game session

           Store(1);
```

```
            setVisible(false);


    }
}
public  void Store(int flag) {
            Date d1=new Date();
            offtime=d1.toString();
            String score="";
            if(flag==1){
                        GregorianCalendar date = new GregorianCalendar();
             edsec = date.get(Calendar.SECOND);
          edmin = date.get(Calendar.MINUTE);
          edhr = date.get(Calendar.HOUR);
          int hr=Math.abs(sthr-edhr);
          int min=Math.abs(stmin-edmin);
          int sec=Math.abs(stsec-edsec);
          score=Integer.toString(hr)+":"+Integer.toString(min)+":"+Integer.toString(sec);

            }
            else{
                        score="Incomplete";
            }
            try
    {
       Class.forName("com.mysql.jdbc.Driver").newInstance();
       Connection con = DriverManager.getConnection(url, user, password);

       Statement stt = con.createStatement();
       stt.execute("USE session");

     System.out.print(ontime);

       stt.execute("INSERT INTO game (User, Score , Login , Logoff) VALUES ('"+u+"',
'"+score+"','"+ontime+"','"+offtime+"')");
       con.close();

}
             catch (Exception e2)
    {
       e2.printStackTrace();
    }
}
 }
```

OUTPUT:



User Name:

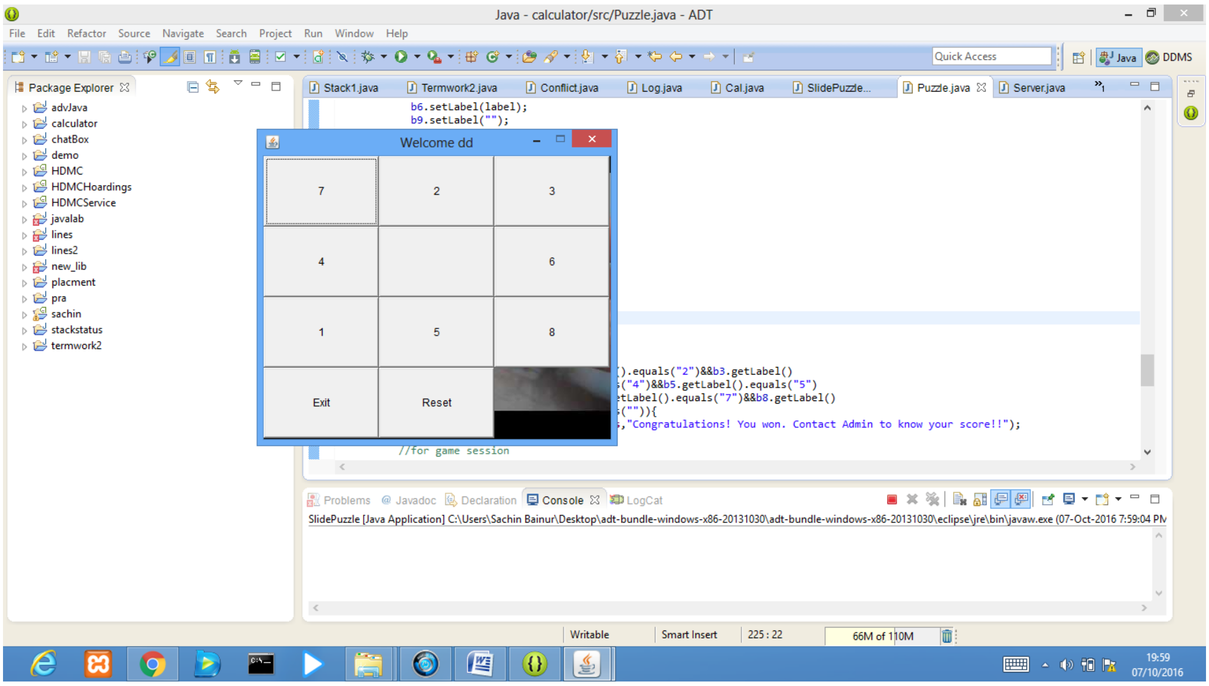
Password:

Submit

*Enter login details
*Arrange the grid in asscending order starting from ONE
*Complete the task in minimum time

```
""")){

)&&b2.getLabel().equals("2")&&b3.getLabel()
Label().equals("4")&&b5.getLabel().equals("5")
ls("6")&&b7.getLabel().equals("7")&&b8.getLabel()
Label().equals("")){
ageDialog(this,"Congratulations! You won. Contact Admin to know your score!!");
```

```
ainur\Desktop\adt-bundle-windows-x86-20131030\adt-bundle-windows-x86-20131030\eclipse\jre\bin\javaw.exe (07-Oct-2016 7:59:04 PM
```



Welcome dd

7	2	3
4		6
1	5	8
Exit	Reset	

```
            b6.setLabel(label);
            b9.setLabel("");

).equals("2")&&b3.getLabel()
("4")&&b5.getLabel().equals("5")
tLabel().equals("7")&&b8.getLabel()
("")){
,"Congratulations! You won. Contact Admin to know your score!!");
        //for game session
```

```
SlidePuzzle [Java Application] C:\Users\Sachin Bainur\Desktop\adt-bundle-windows-x86-20131030\adt-bundle-windows-x86-20131030\eclipse\jre\bin\javaw.exe (07-Oct-2016 7:59:04 PM
```

Termwork : 5

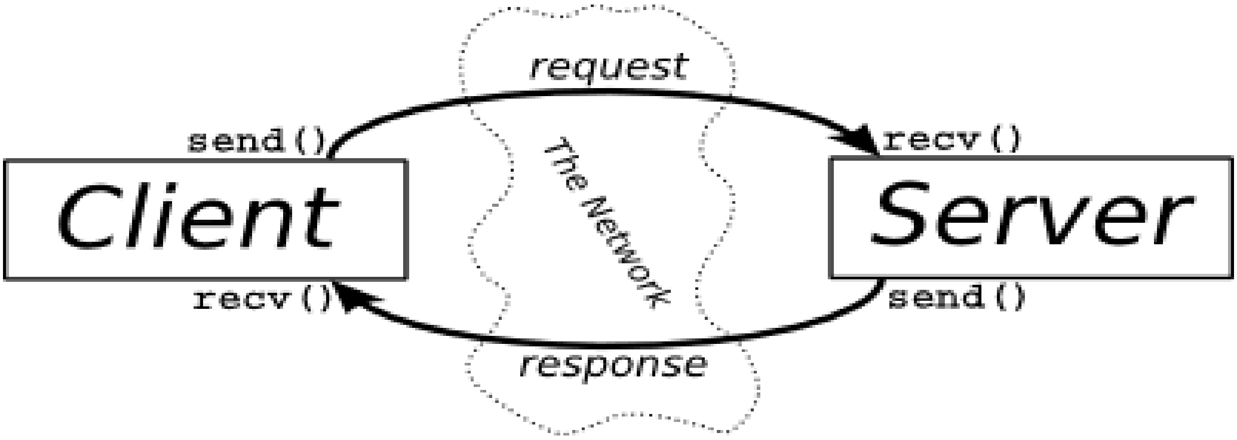
Problem Statement:

Write Java program to implement 1-1 chatting (text) using Networking features.

Design Aspects/State Diagram:

The main aim of this Program is to create a simple server that can add two given numbers. This tutorial has three sections as follows:

- Creating and Running a Server
- Connecting to the server using ip address and port number.
- Creating a Java Client.



Java code:

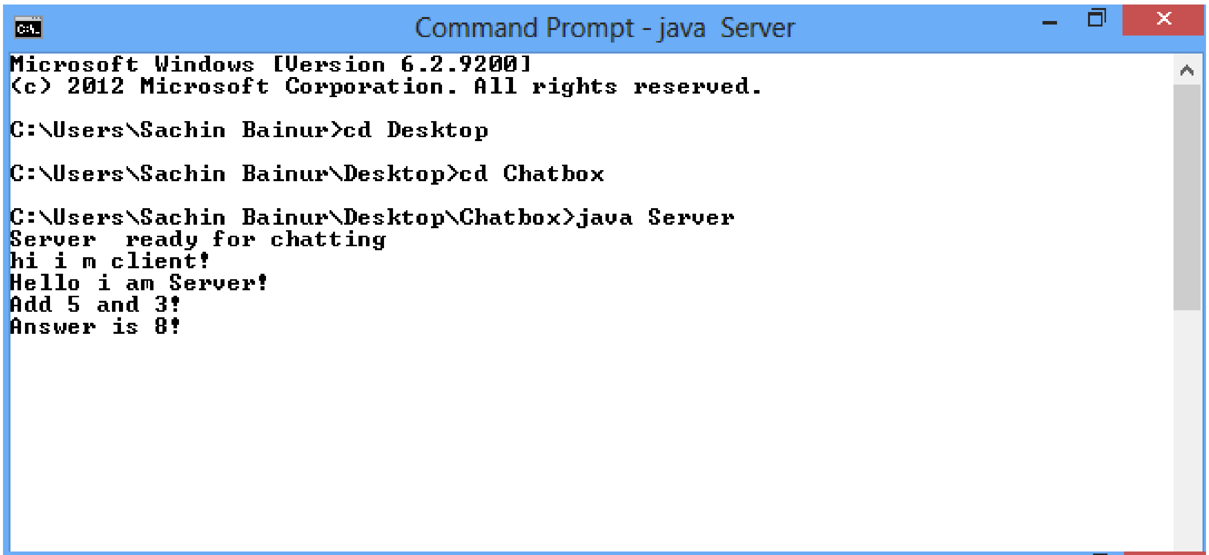
server.java:

```
import java.io.BufferedReader;
import java.io.InputStream;
import java.io.InputStreamReader;
import java.io.OutputStream;
import java.io.PrintWriter;
import java.net.ServerSocket;
import java.net.Socket;
public class Server
{
  public static void main(String[] args) throws Exception
  {
      ServerSocket sersock = new ServerSocket(3000);
      System.out.println("Server  ready for chatting");
      Socket sock = sersock.accept( );
                        // reading from keyboard (keyRead object)
      BufferedReader keyRead = new BufferedReader(new InputStreamReader(System.in));
                            // sending to client (pwrite object)
      OutputStream ostream = sock.getOutputStream();
      PrintWriter pwrite = new PrintWriter(ostream, true);

                        // receiving from server ( receiveRead  object)
      InputStream istream = sock.getInputStream();
      BufferedReader receiveRead = new BufferedReader(new InputStreamReader(istream));

      String receiveMessage, sendMessage;
      while(true)
      {
        if((receiveMessage = receiveRead.readLine()) != null)
        {
          System.out.println(receiveMessage);
        }
        sendMessage = keyRead.readLine();
        pwrite.println(sendMessage);
        pwrite.flush();
      }
    }
}
```

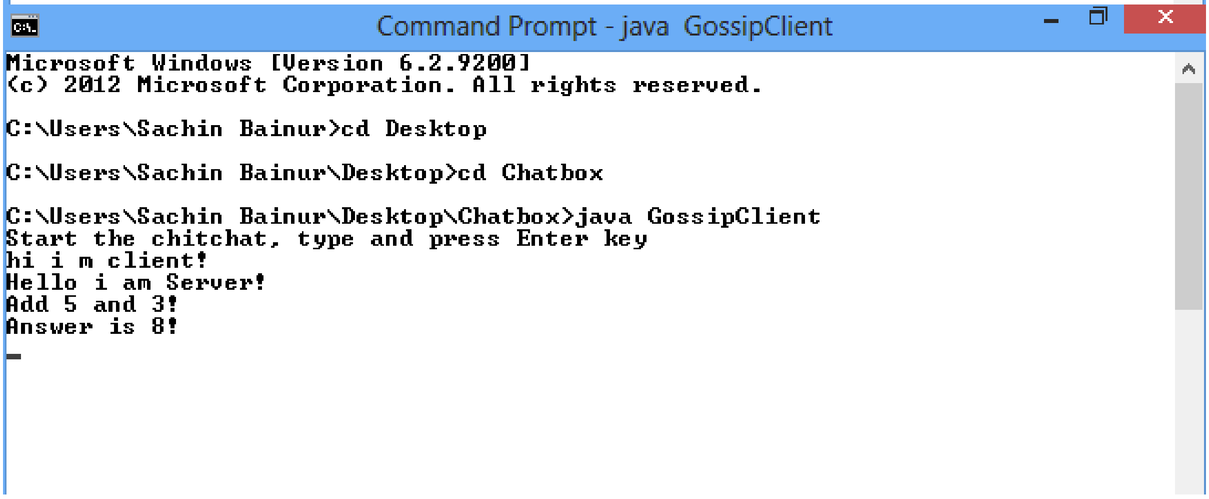
client.java:

```
import java.io.*;
import java.net.*;
public class GossipClient
{
  public static void main(String[] args) throws Exception
  {
     Socket sock = new Socket("127.0.0.1", 3000);
                          // reading from keyboard (keyRead object)
     BufferedReader keyRead = new BufferedReader(new InputStreamReader(System.in));
                         // sending to client (pwrite object)
     OutputStream ostream = sock.getOutputStream();
     PrintWriter pwrite = new PrintWriter(ostream, true);

                         // receiving from server ( receiveRead  object)
     InputStream istream = sock.getInputStream();
     BufferedReader receiveRead = new BufferedReader(new InputStreamReader(istream));

     System.out.println("Start the chitchat, type and press Enter key");

     String receiveMessage, sendMessage;
     while(true)
     {
        sendMessage = keyRead.readLine();  // keyboard reading
        pwrite.println(sendMessage);       // sending to server
        pwrite.flush();                    // flush the data
        if((receiveMessage = receiveRead.readLine()) != null) //receive from server
        {
            System.out.println(receiveMessage); // displaying at DOS prompt
        }
      }
    }
}
```

OUTPUT:



```
Microsoft Windows [Version 6.2.9200]
(c) 2012 Microsoft Corporation. All rights reserved.

C:\Users\Sachin Bainur>cd Desktop

C:\Users\Sachin Bainur\Desktop>cd Chatbox

C:\Users\Sachin Bainur\Desktop\Chatbox>java Server
Server  ready for chatting
hi i m client!
Hello i am Server!
Add 5 and 3!
Answer is 8!
```



```
Microsoft Windows [Version 6.2.9200]
(c) 2012 Microsoft Corporation. All rights reserved.

C:\Users\Sachin Bainur>cd Desktop

C:\Users\Sachin Bainur\Desktop>cd Chatbox

C:\Users\Sachin Bainur\Desktop\Chatbox>java GossipClient
Start the chitchat, type and press Enter key
hi i m client!
Hello i am Server!
Add 5 and 3!
Answer is 8!
_
```