EXPT: 1
DATE:

APPLICATION TO GENERATE ELECTRICITY BILL

AIM:

To develop a java application to generate the electricity bill.

ALGORITHM:

Step 1: Start the netbeansIDE8.2
Step 2: Goto FILE→ new project→java→java application→click next
Step 3: Give the name for the application→Click Finish.
Step 4: Create a class names EBbillCalculation with the necessary variables.
Step 5: Create getdetails() which gets the basic information form the user
Step 6: Create two more method Domestic_Calculation & Commerical_Calculation to calculate the bill and print it.
Step 7: Stop the program.

PROGRAM:

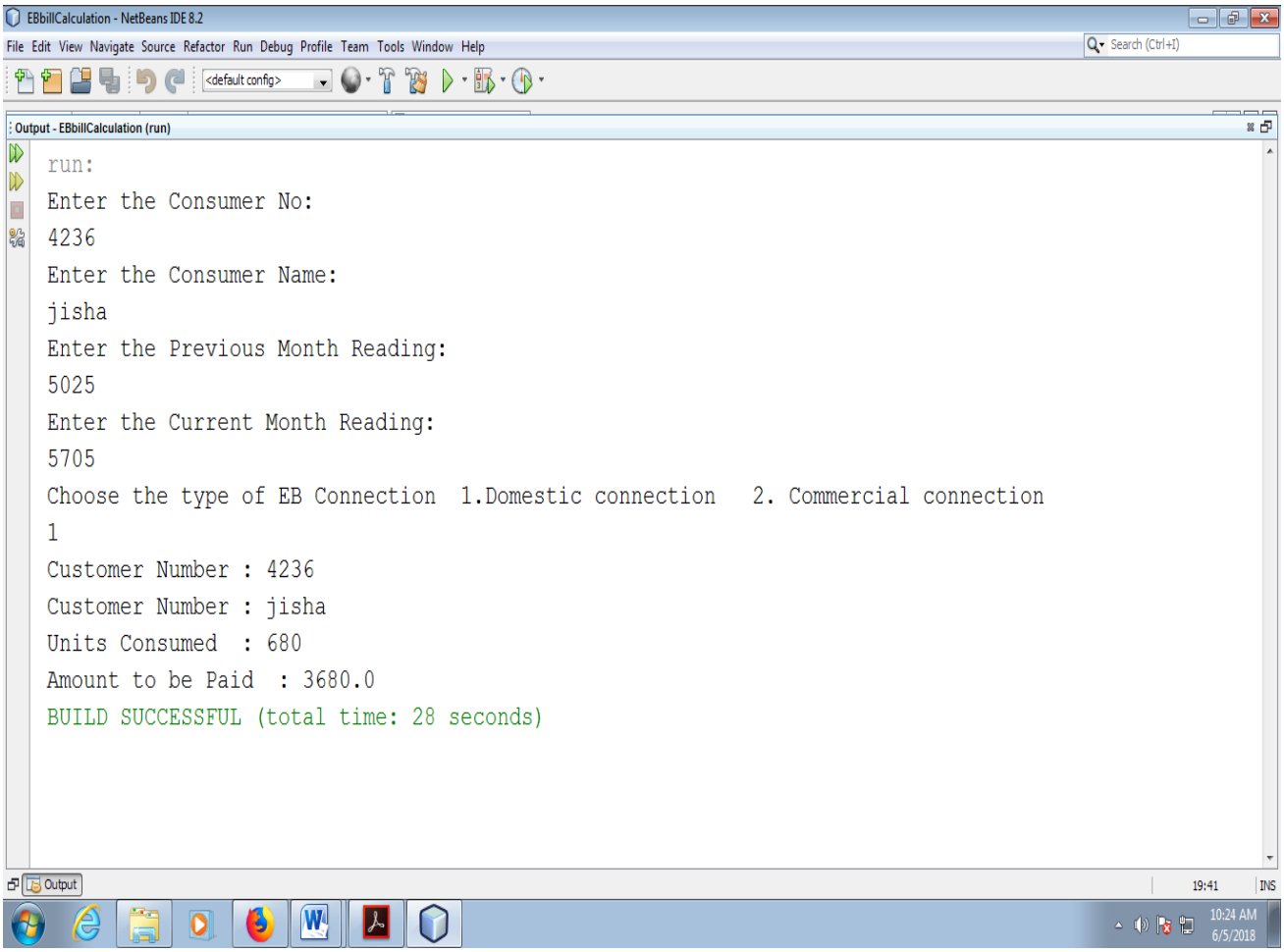
```
import java.io.*;
import java.util.*;
public class EBbillCalculation
 {
        int  cno;
        String cname;
        int pm_reading,cm_reading,units;
        double billpay;
        void getdetails()
        {
                Scanner in = new Scanner(System.in);
                System.out.println("Enter the Consumer No:");
                cno=in.nextInt();
                System.out.println("Enter the Consumer Name:");
```

```
            cname=in.next();
            System.out.println("Enter the Previous Month Reading:");
            pm_reading=in.nextInt();
            System.out.println("Enter the Current Month Reading:");
            cm_reading=in.nextInt();
            units= cm_reading-pm_reading;
            System.out.println("Choose the type of EB Connection
                  1.Domestic connection   2. Commercial connection");
            int ch=in.nextInt();
            switch(ch)
                  {
                  case 1:
                              Domestic_Calculation(units);
                              break;
                  case 2:     Commercial_Calculation(units);
                              break;
                  }
}

      void Domestic_Calculation(int units)
      {
            billpay = 0;
            if(units<=100)
            {
                  billpay=units*1.00;
            }
            else if(units>100 && units<=200)
```

```
        {
                billpay=100*1.00+(units-100)*2.50;
        }
        else if(units>200 && units<=500)
        {
                billpay=100*1.00+200*2.50+(units-200)*4.00;
        }
        else if(units>500)
        {
                billpay =100*1.00+200*2.50+500*4.00+(units-500)*6.00;
        }
        show();
        System.out.println("Amount to be Paid  : " + billpay);
 }
void Commercial_Calculation(int units)
{
billpay = 0;
if(units<=100)
{
        billpay=units*2.00;
}
else if(units>100 && units<=200)
{
   billpay=100*2.00+(units-100)*4.50;
}

else if(units>200 && units<=500)
```

```
    {
            billpay=100*2.00+200*4.50+(units-200)*6.00;
    }
    else if(units>500)
    {
            billpay =100*2.00+200*4.50+500*6.00+(units-500)*7.00;
    }
    show();
    System.out.println("Amount to be Paid  : " + billpay);
    }

public void show()
 {
      System.out.println("Customer Number : " + cno);
      System.out.println("Customer Number : " + cname);
      System.out.println("Units Consumed  : " + units);
  }

 public static void main(String[] args)
     {
            EBbillCalculation eb=new EBbillCalculation();
           eb.getdetails();
   }
}
```

OUTPUT:



RESULT:

Thus the java application for generating the electricity bill is created and executed successfully.

EXPT: 2 a)
DATE:

CURRENCY CONVERTER

AIM:

To develop a java application to implement the currency converter (Dollar to INR, Euro to INR, Yen to INR and Vice Versa)

ALGORITHM:

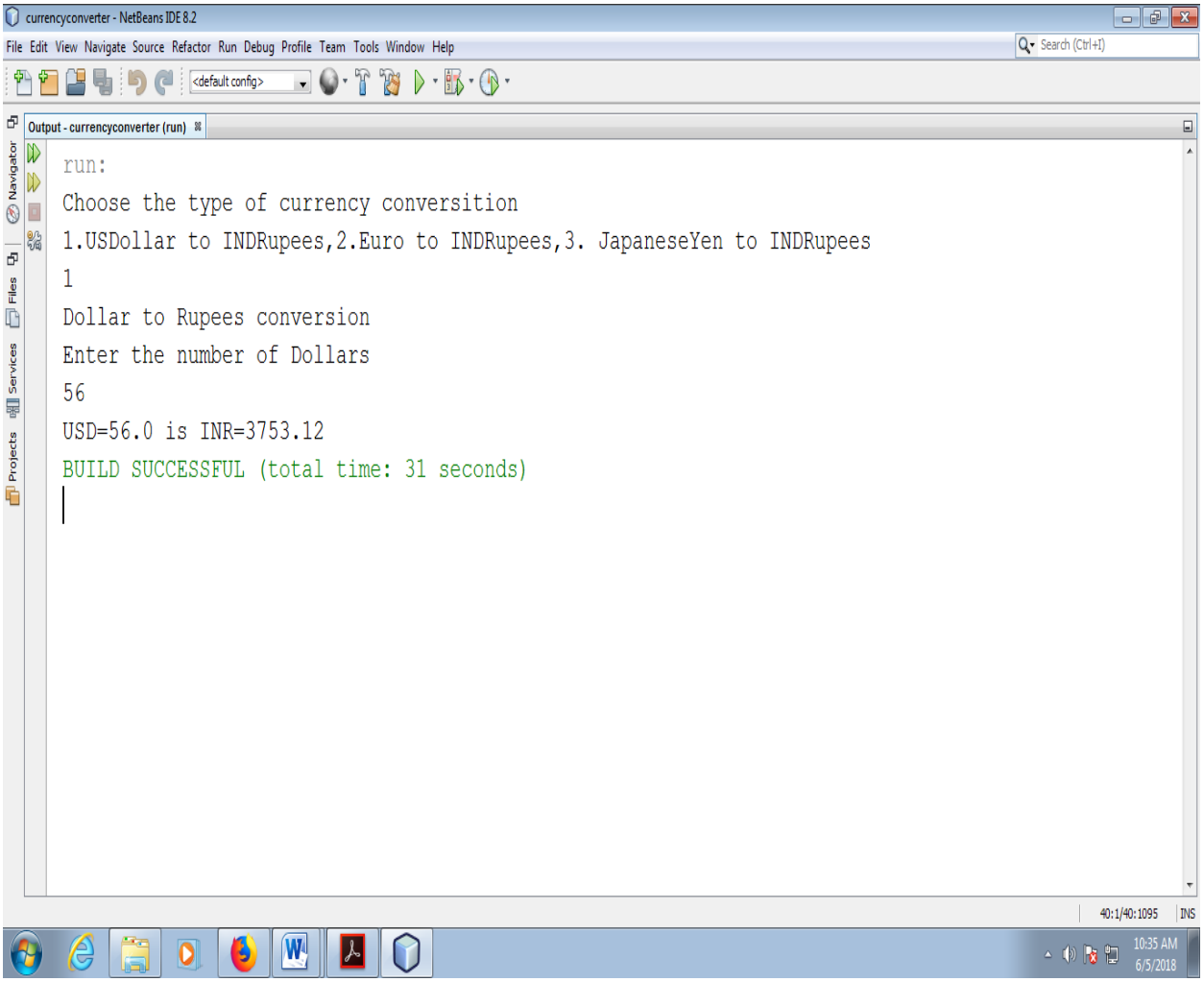
Step 1: Start the netbeansIDE8.2
Step 2: Goto FILE→ new project→java→java application→click next
Step 3: Give the name for the application→Click Finish.
Step 4: Create a class called Currencyconverter takes the type of conversion from user using switch case.
Step 5: Display the result and stop the program.

PROGRAM:

```
package currencyconverter;

import java.io.*;
import java.util.Scanner;

public class Currencyconverter {

   public static void main(String[] args) {

      double Rs;
      Scanner in = new Scanner(System.in);
   System.out.println("Choose the type of currency conversition");
System.out.println("1.USDollar to INDRupees,2.Euro to INDRupees,3. JapaneseYen to INDRupees");
int ch=in.nextInt();
switch(ch)
```

```
{
        case 1:     System.out.println("Dollar to Rupees conversion");
                    System.out.println("Enter the number of Dollars");
                    double dollar=in.nextInt();
                    Rs=dollar*67.02;
                    System.out.println("USD="+dollar+" is INR="+Rs);
                    break;
        case 2:     System.out.println("EURO to Rupees conversion");
                    System.out.println("Enter the number of EURO");
                    double Euro=in.nextInt();
                    Rs=Euro*78.29;
                    System.out.println("Euro="+Euro+" is INR="+Rs);
                    break;
        case 3:     System.out.println("Japanese Yen to Rupees conversion");
                    System.out.println("Enter the number of Yen");
                    double Yen=in.nextInt();
                    Rs=Yen*0.61;
                    System.out.println("Yen="+Yen+" is INR="+Rs);
                    break;
}

}
}
```

OUTPUT:



RESULT:

Thus the java application to implement the currency converter is created and executed successfully.

EXPT: 2 b)
DATE:

DISTANCE CONVERTER

AIM:

To develop a java application to implement the distance converter (Meter to Kilometer, Miles to Kilometers)

ALGORITHM:

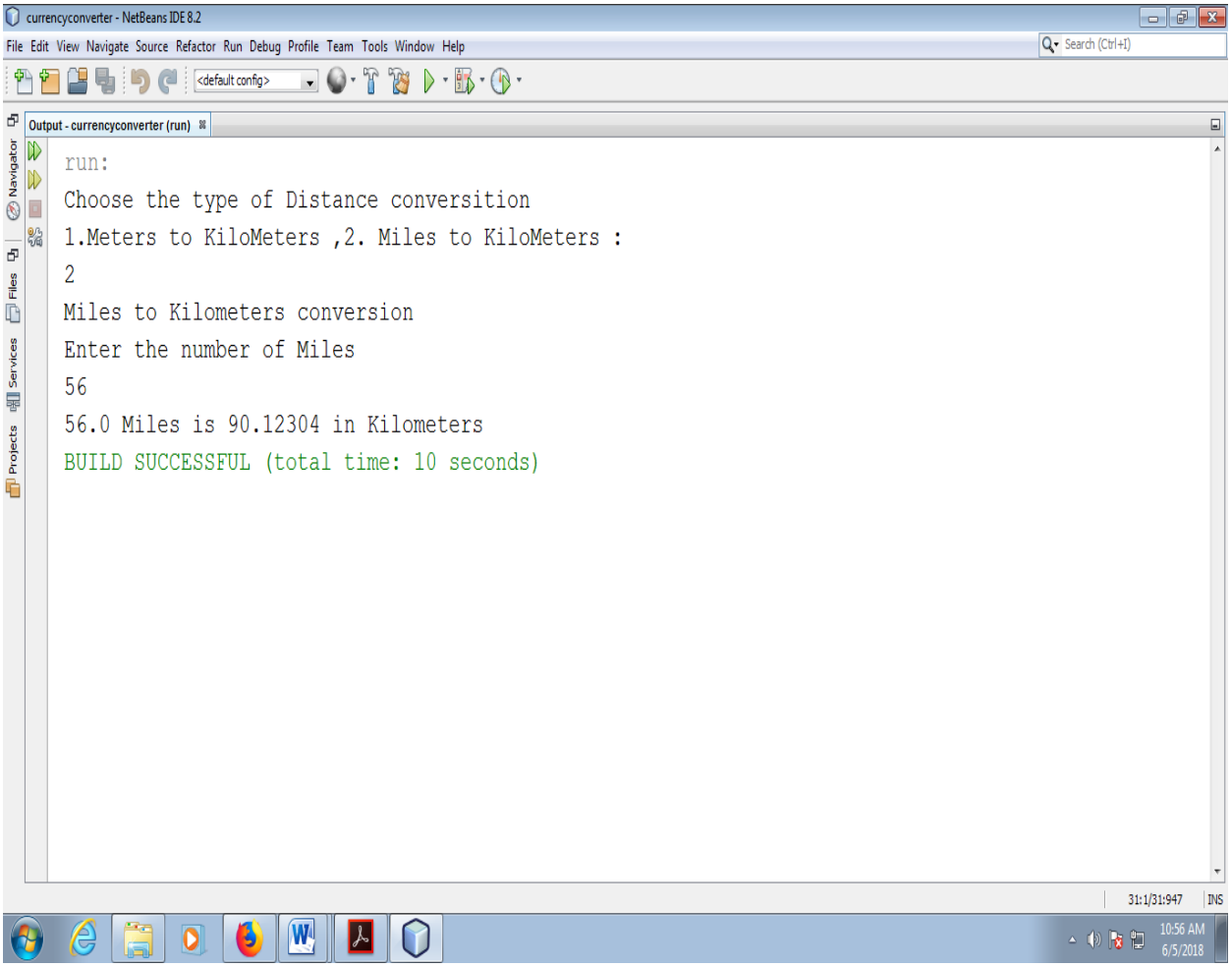
Step 1: Start the netbeansIDE8.2
Step 2: Goto FILE→ new project→java→java application→click next
Step 3: Give the name for the application→Click Finish.
Step 4: Create a class called distanceconvertor takes the type of conversion from user using switch case.
Step 5: Case1 chooses the Meters into KiloMeters and Case2 Miles to KiloMeters
Step 6: Display the result and stop the program.

PROGRAM:

```
package currencyconverter;
import java.io.*;
import java.util.Scanner;
public class distanceconvertor {
   public static void main(String args[])
   {
      double meters,kilometers,miles;
      Scanner in = new Scanner(System.in);


   System.out.println("Choose the type of Distance conversion");
       System.out.println("1.Meters to KiloMeters ,2. Miles to KiloMeters :");
       int ch=in.nextInt();
switch(ch)
{
       case 1:         System.out.println("Meters into KiloMeters");
```

```
                System.out.println("Enter the number of Meters");
                meters=in.nextDouble();
                kilometers = meters * 0.001;
                System.out.println( meters+ " Meters is " +kilometers+ " in
Kilometers");
                break;
        case 2:  System.out.println("Miles to Kilometers conversion");
                System.out.println("Enter the number of Miles");
                miles=in.nextDouble();
                kilometers =miles * 1.60934;
                System.out.println( miles+ " Miles is " +kilometers + " in
Kilometers");
                break;
}
}
}
```

OUTPUT:



RESULT:

Thus the java application to implement the distance converter is created and executed successfully.

EXPT: 2 C)
DATE:

TIME CONVERTER

AIM:

To develop a java application to implement the time converter (hours to minutes, seconds and vice versa)

ALGORITHM:

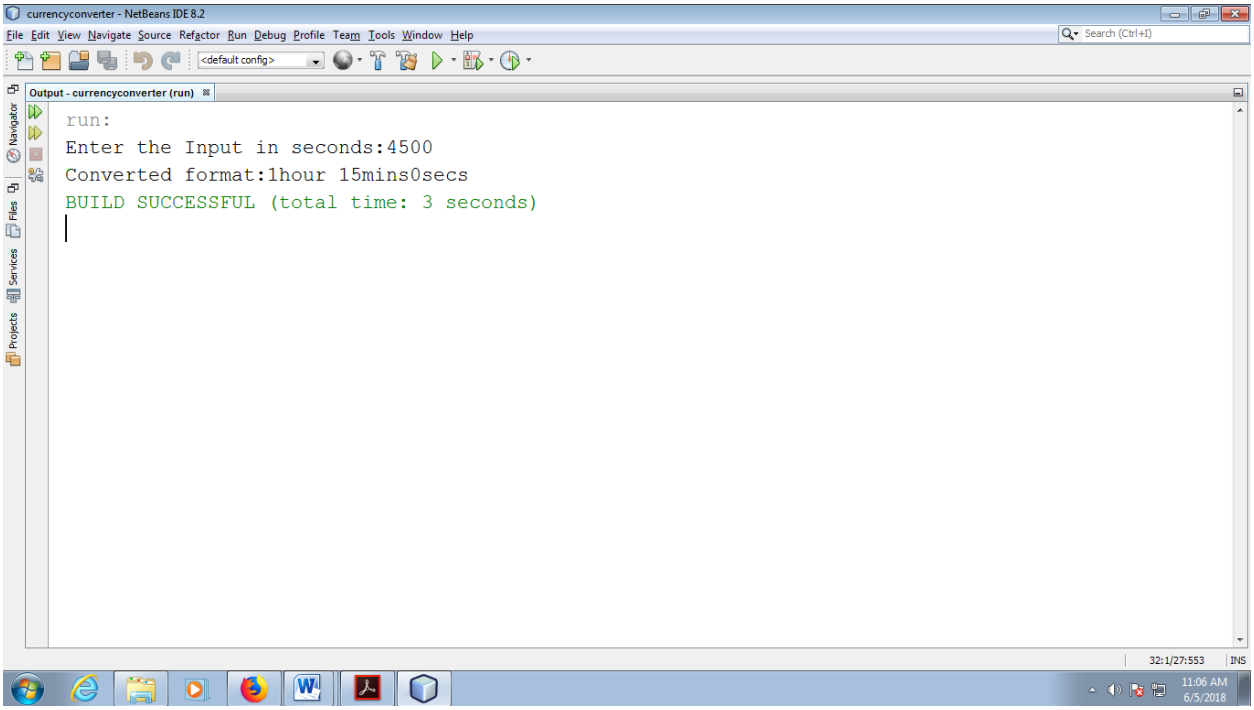
Step 1: Start the netbeansIDE8.2
Step 2: Goto FILE→ new project→java→java application→click next
Step 3: Give the name for the application→Click Finish.
Step 4: Create a class called Timeconverter takes seconds as input form the user and display the result to user.
Step 5: Stop the program.

PROGRAM:

```
package currencyconverter;

import java.util.Scanner;

public class Timeconverter
{
	public static void main(String[] args) {
	int n,hr,min,sec;
	Scanner in = new Scanner(System.in);
	  System.out.print("Enter the Input in seconds:");
	  n= in.nextInt();
	  if(n>3600){
		min = n/60;
		sec = n%60;
		hr = min/60;
		min = min%60;
		System.out.println("Converted format:"+hr+ "hour " + min +"mins" +
sec+"secs");
	  }
```

```
        else{
                min = n/60;
                sec = n%60;
                System.out.println("Converted format :"+min+" mins " +sec +"secs");
        }
    }

}
```

OUTPUT:



RESULT:

Thus the java application for time converter is created and executed successfully.

EXPT: 3
DATE:

EMPLOYEE PAYROLL PROCESS

AIM:

To develop a java application to calculate the payroll and generate the pay slip for the employee

ALGORITHM:

Step 1: Start the netbeansIDE8.2
Step 2: Goto FILE→ new project→java→java application→click next
Step 3: Give the name for the application→Click Finish.
Step 4: Create a class called Emp and declare the necessary variables.
Step 5: Create the method getEmployeedetails() which collect the basic information from the employee.
Step 6: Create the method pay_calulation () for calculating the gross and net salary from the basic pay of the employee.
Step 7: Print the output and stop execution.

PROGRAM:

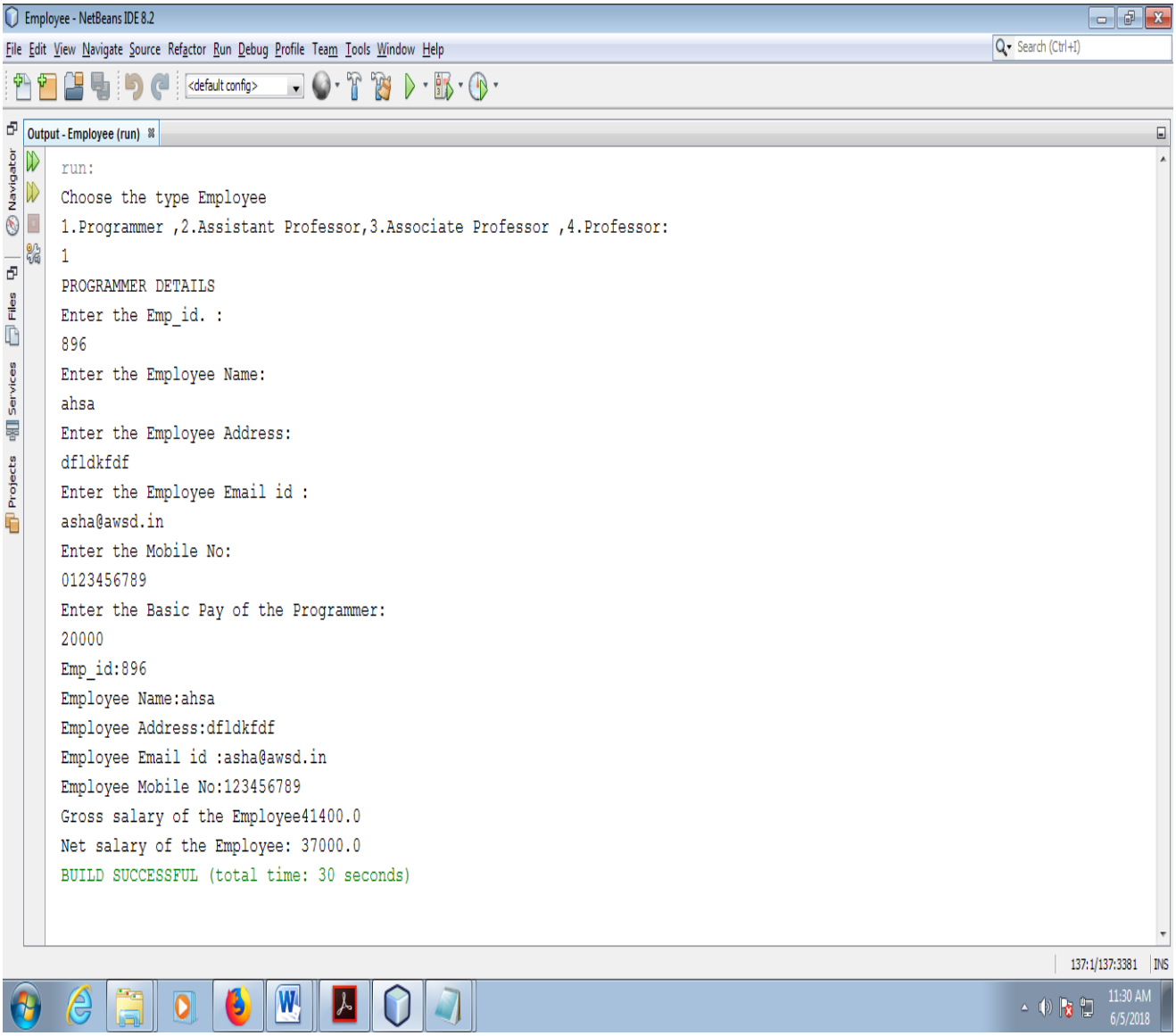
```
package employee;
import java.io.IOException;
import java.util.Scanner;

class Emp
{
  String ename,Address,email;
  int eid;
  int mobile;

 void getEmployeedetails()
{
Scanner in = new Scanner(System.in);
System.out.println("Enter the Emp_id. :");
 eid=in.nextInt();
System.out.println("Enter the Employee Name:");
```

```
 ename=in.next();
System.out.println("Enter the Employee Address:");
 Address=in.next();
System.out.println("Enter the Employee Email id :");
email=in.next();
System.out.println("Enter the Mobile No:");
mobile=in.nextInt();
}
  void pay_calulation(double BasicPay)
  {
      double DA,HRA,PF,Sfund,Gross_Salary,Netsalary;
        DA=BasicPay*0.97;
          HRA=BasicPay*0.10;
          PF=BasicPay*0.12;
          Sfund=BasicPay*0.1;
         Gross_Salary=BasicPay+DA+HRA;
         Netsalary=Gross_Salary-(PF+Sfund);
       System.out.println("Gross salary of the Employee"+Gross_Salary);
         System.out.println("Net salary of the Employee: "+Netsalary);

  }
void display()
{
         System.out.println("Emp_id:"+eid);
         System.out.println("Employee Name:"+ename);
         System.out.println("Employee Address:"+Address);
         System.out.println("Employee Email id :"+email);
         System.out.println("Employee Mobile No:"+mobile);
}
}
class Programmer extends Emp
{
    double BasicPay;
          void Programmerdetails()
          {
        getEmployeedetails();
          Scanner in = new Scanner(System.in);
          System.out.println("Enter the Basic Pay of the Programmer:");
          BasicPay=in.nextInt();
        display();
```

```
        pay_calulation(BasicPay);
          }
}
class AssistantProfessor extends Emp
{

          void APDetails()
          {
         double BasicPay;
          getEmployeedetails();
          Scanner in = new Scanner(System.in);
          System.out.println("Enter the Basic Pay of the AssistantProfessor:");
          BasicPay=in.nextInt();
          display();
          pay_calulation(BasicPay);
          }

}
class AssociateProfessor extends Emp
{
   double BasicPay;

          void ASPDetails()
          {
          getEmployeedetails();
          Scanner in = new Scanner(System.in);
          System.out.println("Enter the Basic Pay of the AssociateProfessor:");
           BasicPay=in.nextInt();
           display();
           pay_calulation(BasicPay);
          }

}
class Professor extends Emp
{
   double BasicPay;
          void profDetails()
          {
          getEmployeedetails();
          Scanner in = new Scanner(System.in);
```

```
        System.out.println("Enter the Basic Pay of the Professor:");
        BasicPay=in.nextInt();
        display();
        pay_calulation(BasicPay);
        }

}

public class Employee
{

        public static void main(String[] args)
        {

        Scanner in = new Scanner(System.in);
      System.out.println("Choose the type Employee");
      System.out.println("1.Programmer ,2.Assistant Professor,3.Associate Professor
,4.Professor: ");
      int ch=in.nextInt();
      switch(ch)
      {
        case 1:         System.out.println("PROGRAMMER DETAILS");
                    Programmer p=new Programmer();
                        p.Programmerdetails();
                        break;
      case 2:  System.out.println("Assistant Professor DETAILS");
                        AssistantProfessor ap=new AssistantProfessor();
                    ap.APDetails();
                        break;
      case 3:  System.out.println("Associate Professor DETAILS");
                        AssociateProfessor asp=new AssociateProfessor();
                    asp.ASPDetails();
                        break;
      case 4:  System.out.println("Professor DETAILS");
                        Professor pf=new Professor();
                    pf.profDetails();
                        break;

      }
   } }
```

OUTPUT:



RESULT:

Thus the java program for generating the employee pay slip is created and executed successfully.

EXPT: 4
DATE:

ADT STACK

AIM:

To develop a program using Java interface for ADT Stack

ALGORITHM:

Step 1: Start the netbeansIDE8.2
Step 2: Goto FILE→ new project→java→java application→click next
Step 3: Give the name for the application→Click Finish.
Step 4: Create an interface Mystack with methods push,pop,display.
Step 5: Create a class stack_array which implements the interface Mystack
Step 6: Create the main class with switch case which gets the input from the user to Push / Pop / Display

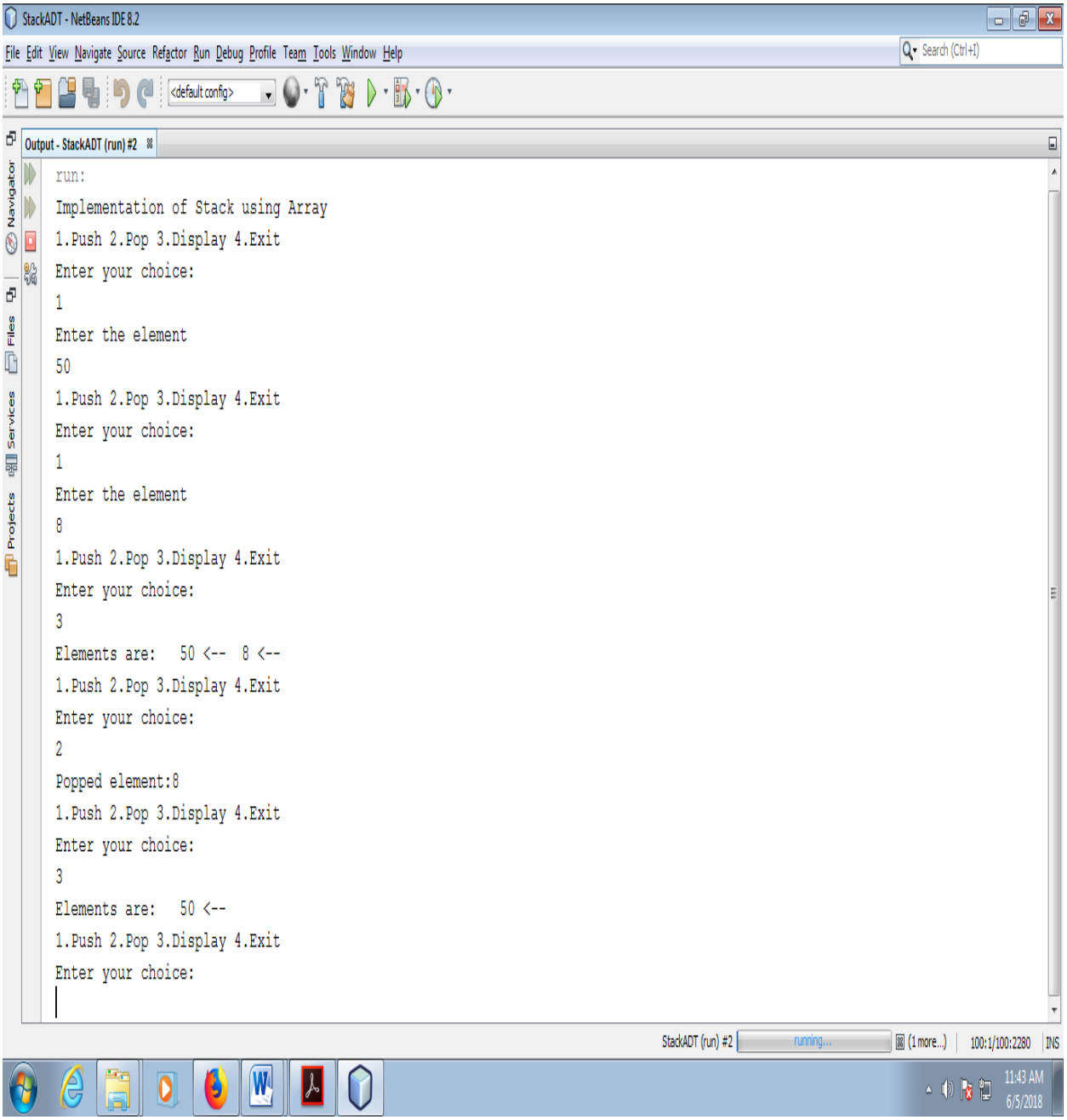
PROGRAM:

```
package stackadt;
import java.io.*;
interface Mystack
{
   public void pop();
   public void push();
   public void display();
}
class Stack_array implements Mystack
{
   final static int n=5;
   int stack[]=new int[n];
   int top=-1;
   public void push()
   {
      try
      {
         BufferedReader br=new BufferedReader(new
InputStreamReader(System.in));
```

```
            if(top==(n-1))
            {
               System.out.println(" Stack Overflow");
               return;
            }
            else
            {
               System.out.println("Enter the element");
               int ele=Integer.parseInt(br.readLine());
               stack[++top]=ele;
            }
}
         catch(IOException e)
         {
            System.out.println("e");
         }
      }
      public void pop()
      {
         if(top<0)
         {
            System.out.println("Stack underflow");
            return;
         }
         else
         {
            int popper=stack[top];
            top--;
            System.out.println("Popped element:" +popper);
         }
      }

      public void display()
      {
         if(top<0)
         {
            System.out.println("Stack is empty");
            return;
         }
         else
```

```
        {
            String str=" ";
            for(int i=0; i<=top; i++)
                str=str+"  "+stack[i]+" <--";
            System.out.println("Elements are:"+str);
        }
    }
}
class StackADT
{
    public static void main(String arg[])throws IOException
    {
        BufferedReader br=new BufferedReader(new
InputStreamReader(System.in));
        System.out.println("Implementation of Stack using Array");
        Stack_array stk=new Stack_array();
        int ch=0;
        do
        {
            System.out.println("1.Push 2.Pop 3.Display 4.Exit");
            System.out.println("Enter your choice:");
            ch=Integer.parseInt(br.readLine());
            switch(ch)
            {
            case 1:
                stk.push();
                break;
            case 2:
                stk.pop();
                break;
            case 3:
                stk.display();
                break;
            case 4:
                System.exit(0);
            }
        }
        while(ch<5);
                }
}
```

OUTPUT:



RESULT:

Thus the program for program using Java interface for ADT Stack has been written and executed successfully.

EXPT: 5
DATE:

ARRAY LIST

AIM:

To write a java program to perform string operations using Array List

ALGORITHM:

Step 1: Start the netbeansIDE8.2

Step 2: Goto FILE→ new project→java→java application→click next

Step 3: Give the name for the application→Click Finish.

Step 4: Create an Array list named arrlist, arrlist2 and

add the strings using add()method.

Step 5: Append the arrlist2 to the end of arrlist Using addAll() method .

Step 6: Search the string in Arraylist by using contain() method. if the string is

found , print search is successful otherwise try again.

Step 7: Print all string starts with given letter by using matches() method.

Step 8: Stop the program.

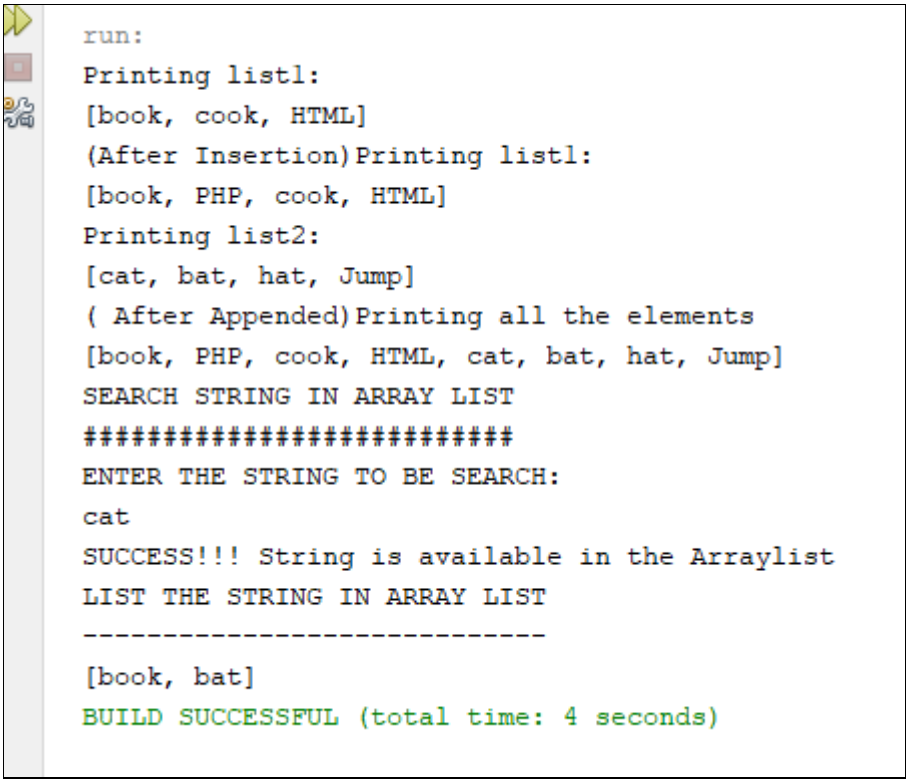
PROGRAM:

```
import java.util.ArrayList;
import java.util.Scanner;


public class ArrayListDemo
 {
   public static void main(String args[])
 {
      ArrayList<String> arrlist = new ArrayList<>();
           arrlist.add("book");
          arrlist.add("cook");
          arrlist.add("HTML");
          System.out.println("Printing list1:");
          System.out.println(arrlist);
          arrlist.add(1,"PHP");
          System.out.println("(After Insertion)Printing list1:");
          System.out.println(arrlist);
      ArrayList<String> arrlist2 = new ArrayList<>();
          arrlist2.add("cat");
          arrlist2.add("bat");
          arrlist2.add("hat");
          arrlist2.add("Jump");
          System.out.println("Printing list2:");
```

```
System.out.println(arrlist2);
arrlist.addAll(arrlist2);


System.out.println("( After Appended)Printing all the elements");
System.out.println(arrlist);
System.out.println("SEARCH STRING IN ARRAY LIST");
System.out.println("############################");
Scanner in = new Scanner(System.in);
System.out.println("ENTER THE STRING TO BE SEARCH:");
String searchString=in.next();
boolean Found = arrlist.contains(searchString);
if(Found)
        System.out.println("SUCCESS!!! String is available in the Arraylist");
else
         System.out.println("Failure!!! Try Again");
 System.out.println("LIST THE STRING IN ARRAY LIST");
System.out.println("-----------------------------------------------");
 ArrayList <String> listClone = new ArrayList<>();
     for (String string : arrlist)
         {
                 if(string.matches("(?i)(b).*"))
                 {
                         listClone.add(string);
```

```
                    }
                }
        System.out.println(listClone);
          }
}
```

OUTPUT:



```
run:
Printing list1:
[book, cook, HTML]
(After Insertion)Printing list1:
[book, PHP, cook, HTML]
Printing list2:
[cat, bat, hat, Jump]
( After Appended)Printing all the elements
[book, PHP, cook, HTML, cat, bat, hat, Jump]
SEARCH STRING IN ARRAY LIST
##########################
ENTER THE STRING TO BE SEARCH:
cat
SUCCESS!!! String is available in the Arraylist
LIST THE STRING IN ARRAY LIST
----------------------------
[book, bat]
BUILD SUCCESSFUL (total time: 4 seconds)
```

RESULT:

Thus the program for Arraylist has been written and executed successfully.

EXPT: 6
DATE:

ABSTRACT CLASS

AIM:

To write a java program to create an abstract class named Shape .

ALGORITHM:

Step 1: Start the netbeansIDE8.2
Step 2: Goto FILE→ new project→java→java application→click next
Step 3: Give the name for the application→Click Finish.
Step 4: Create an abstract class named Shape that contains two integers and an empty method named print Area()
Step 5: Create three classes named Rectangle, Triangle and Circle which extends Shape
Step 6: Print the area of the given shapes.
Step 7: Stop the program.

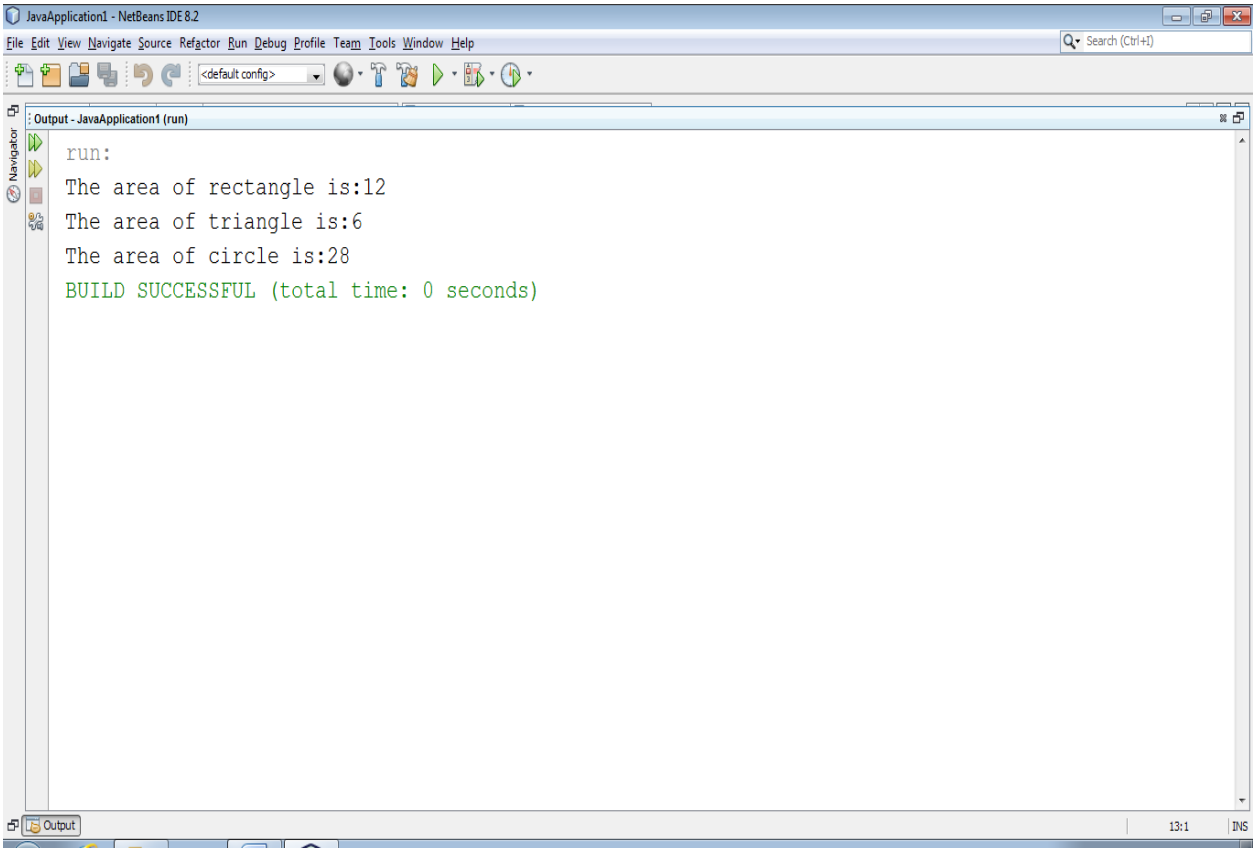
PROGRAM:

```
package javaapplication3;

abstract class shape

{

int a=3,b=4;

 abstract public void print_area();

}

class rectangle extends shape

{
```

```
 public int area_rect;
       @Override
 public void print_area()
 {
  area_rect=a*b;
              System.out.println("The area of rectangle is:"+area_rect);
 }
}
class triangle extends shape
{
 int area_tri;
       @Override
 public void print_area()
 {
  area_tri=(int) (0.5*a*b);
              System.out.println("The area of triangle is:"+area_tri);
 }
}
class circle extends shape
```

```
{
 int area_circle;
       @Override
 public void print_area()
 {
  area_circle=(int) (3.14*a*a);
              System.out.println("The area of circle is:"+area_circle);
 }
}
public class JavaApplication3 {
    public static void main(String[] args) {
        rectangle r=new rectangle();
        r.print_area();
        triangle t=new triangle();
        t.print_area();
        circle r1=new circle();
        r1.print_area();
           }
}
```

OUTPUT:



RESULT:

Thus the program for abstract class has been written and executed successfully.

EXPT: 7
DATE:

USER DEFINED EXCEPTION HANDLING

AIM:

To write a Java program to implement user defined exception handling.

ALGORITHM:

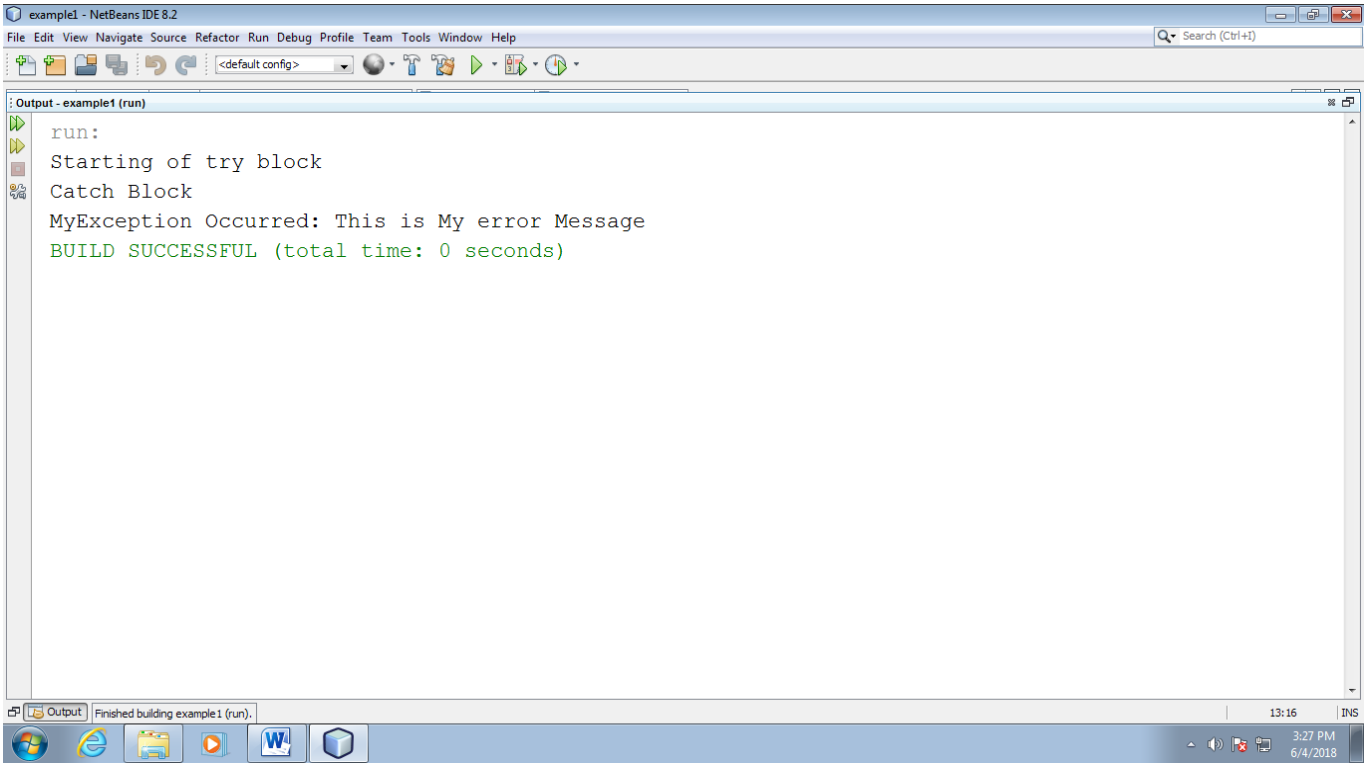
Step 1: Start the netbeansIDE8.2
Step 2: Goto FILE→ new project→java→java application→click next
Step 3: Give the name for the application→Click Finish.
Step 4: Create a user defined exception called MyException which extends class Exception.
Step 5: Create try-catch block to handle the exception.
Step 6: Throw an exception of user defined type as an argument in main()
Step 7: Exception is handled using try, catch block
Step 8: Display the user defined exception.

PROGRAM:

```
package example1;

class MyException extends Exception{
  String str1;
  MyException(String str2) {
        str1=str2;
  }
  public String toString(){
        return ("MyException Occurred: "+str1) ;
  }
}
public class Example1 {

   public static void main(String[] args)

   {
      try{
```

```
                System.out.println("Starting of try block");
                // I'm throwing the custom exception using throw
                throw new MyException("This is My error Message");
            }
            catch(MyException exp){
                System.out.println("Catch Block") ;
                System.out.println(exp) ;
            }
        }

    }
```

OUTPUT:



RESULT:

Thus the program user defined exception handling has been written and executed successfully.

EXPT: 8
DATE:

FILE OPERATIONS

AIM:

To write a Java program to implement the concepts of file.

ALGORITHM:

Step 1: Start the program
Step 2: Open the notepad and type the program and save the program as Filedemo.java
Step 3: Click on the Cmd Prompt → cd C:\Java\jdk1.8\bin
Step 4: Now compile the Filedemo.java using
javac Filedemo.java
Step 5: Before executing the Filedemo.java create another java file using notepad called Fib.java
Step 6: Execute the program using
java Filedemo.java and give the input file name Fib.java
Step 7: Stop the program.

PROGRAM:

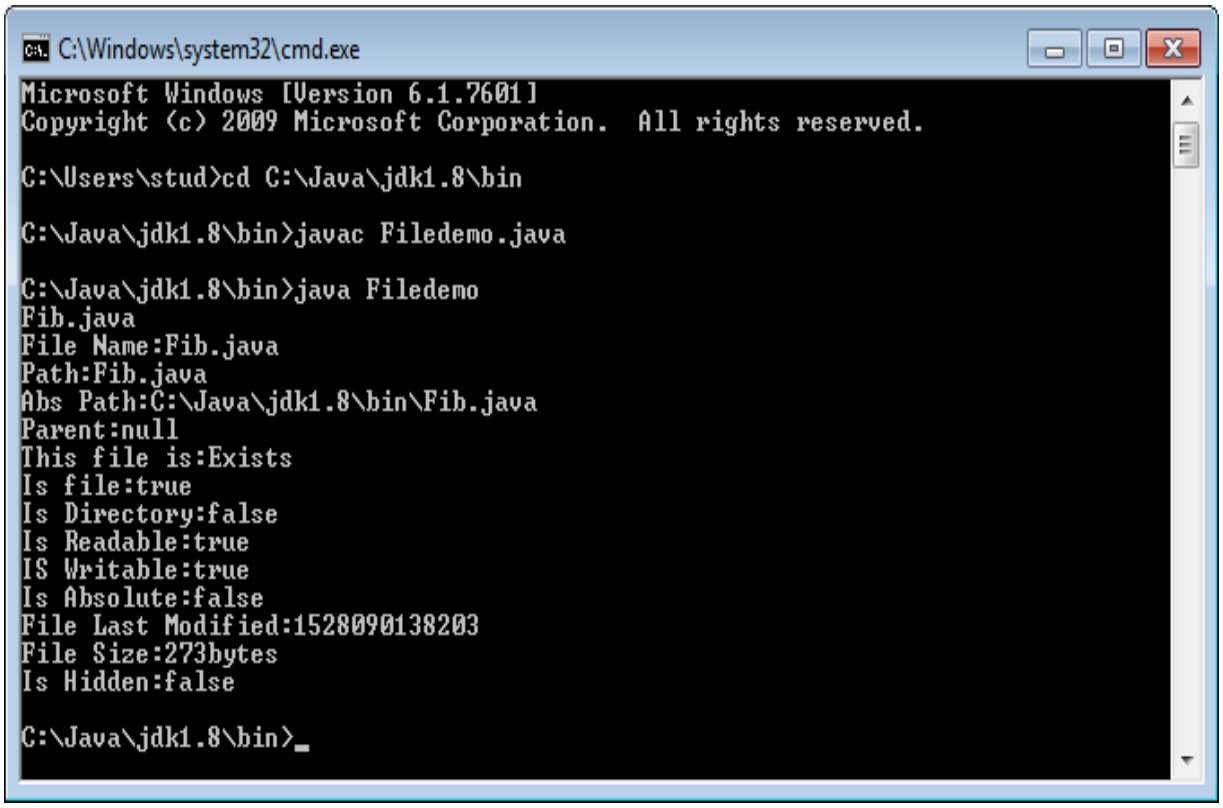
```
import java.util.Scanner;
import java.io.File;

public class Filedemo {

   public static void main(String[] args) {

                Scanner input=new Scanner(System.in);
                String s=input.nextLine();
                File f1=new File(s);
                System.out.println("File Name:"+f1.getName());
                System.out.println("Path:"+f1.getPath());
                System.out.println("Abs Path:"+f1.getAbsolutePath());
                System.out.println("Parent:"+f1.getParent());
```

```
                System.out.println("This file is:"+(f1.exists()?"Exists":"Does not
exists"));
                System.out.println("Is file:"+f1.isFile());
                System.out.println("Is Directory:"+f1.isDirectory());
                System.out.println("Is Readable:"+f1.canRead());
                System.out.println("IS Writable:"+f1.canWrite());
                System.out.println("Is Absolute:"+f1.isAbsolute());
                System.out.println("File Last Modified:"+f1.lastModified());
                System.out.println("File Size:"+f1.length()+"bytes");
                System.out.println("Is Hidden:"+f1.isHidden());

    }

}
```

OUTPUT:

Fib.java

```
public class Fib {

    public static void main(String[] args) {
        int n1=0,n2=1,n3,i,count=10;
 System.out.print(n1+" "+n2);

 for(i=2;i<count;++i)
 {
  n3=n1+n2;
  System.out.print(" "+n3);
  n1=n2;
  n2=n3;
    }
    }
}
```



RESULT:

Thus the program for implementing the file concept has been written and executed successfully.

EXPT: 9
DATE:

MULTI THREADING

AIM:

To write a Java program to implement the concepts of multithreading.

ALGORITHM:

Step 1: Start the netbeansIDE8.2
Step 2: Goto FILE→ new project→java→java application→click next
Step 3: Give the name for the application→Click Finish.
Step 4: Create three threads A, odd, even
Step 5: Thread A generates the random number
Step 6: If random number is even ,Thread even will display the square of the random number
Step 7: If random number is odd ,Thread odd will display the cube of the random number

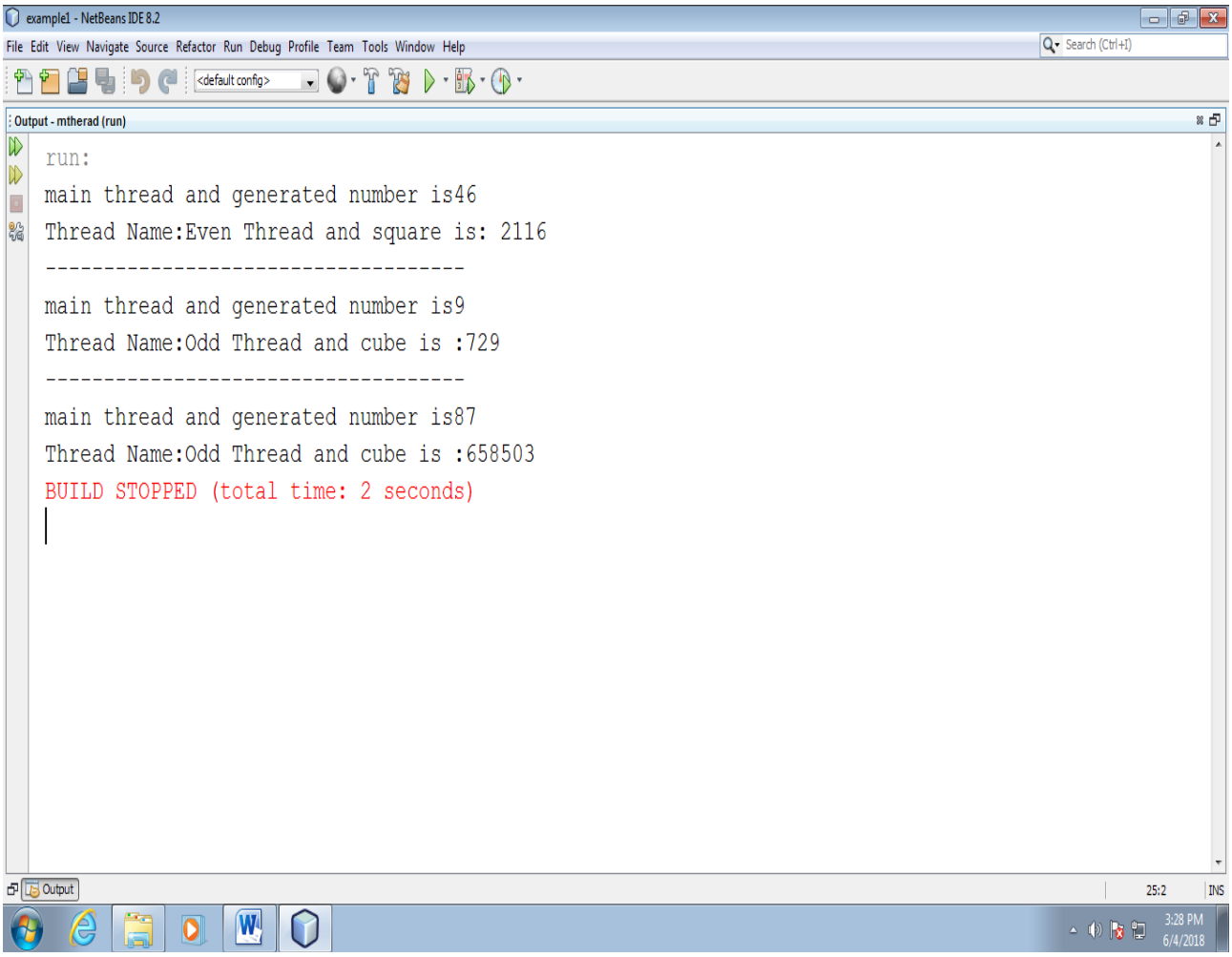
PROGRAM:

```
package mtherad;
import java.util.*;

class even implements Runnable{
   public int x;
   public even(int x){
      this.x=x;
   }

   @Override
   public void run()
   {
      System.out.println("Thread Name:Even Thread and square is: " + x * x);

   }

}
```

```
class odd implements Runnable{
   public int x;
   public odd(int x){
      this.x=x;
   }
   @Override
   public void run()
   {
      System.out.println("Thread Name:Odd Thread and cube is :"+ x * x * x);

   }

}
class A extends Thread{
   public String tname;
   public Random r;
   public Thread t1,t2;
   public A(String s){
      tname=s;
   }
   @Override
   public void run()
{
   int num=0;
   r=new Random();
   try {
      for(int i=0;i<50;i++){
         num=r.nextInt(100);
      System.out.println("main thread and generated number is"+num);
      if(num%2==0)
      {
         t1=new Thread(new even(num));
         t1.start();
      }else{
        t2=new Thread(new odd(num));
         t2.start();
      }
      Thread.sleep(1000);
      System.out.println("-----------------------------------");
}
```

```
}

   catch(InterruptedException ex)
   {
      System.out.println(ex.getMessage());
   }
}
}

public class Mtherad {

   public static void main(String[] args) {
       A a=new A("one");
      a.start();
   }

}
```

OUTPUT:



RESULT:

Thus the program for implementing the concept of multithreading has been written and executed successfully.

EXPT: 10
DATE:

GENERIC FUNCTION

AIM:

To write a Java program to find the maximum value in a given generic function.

ALGORITHM:

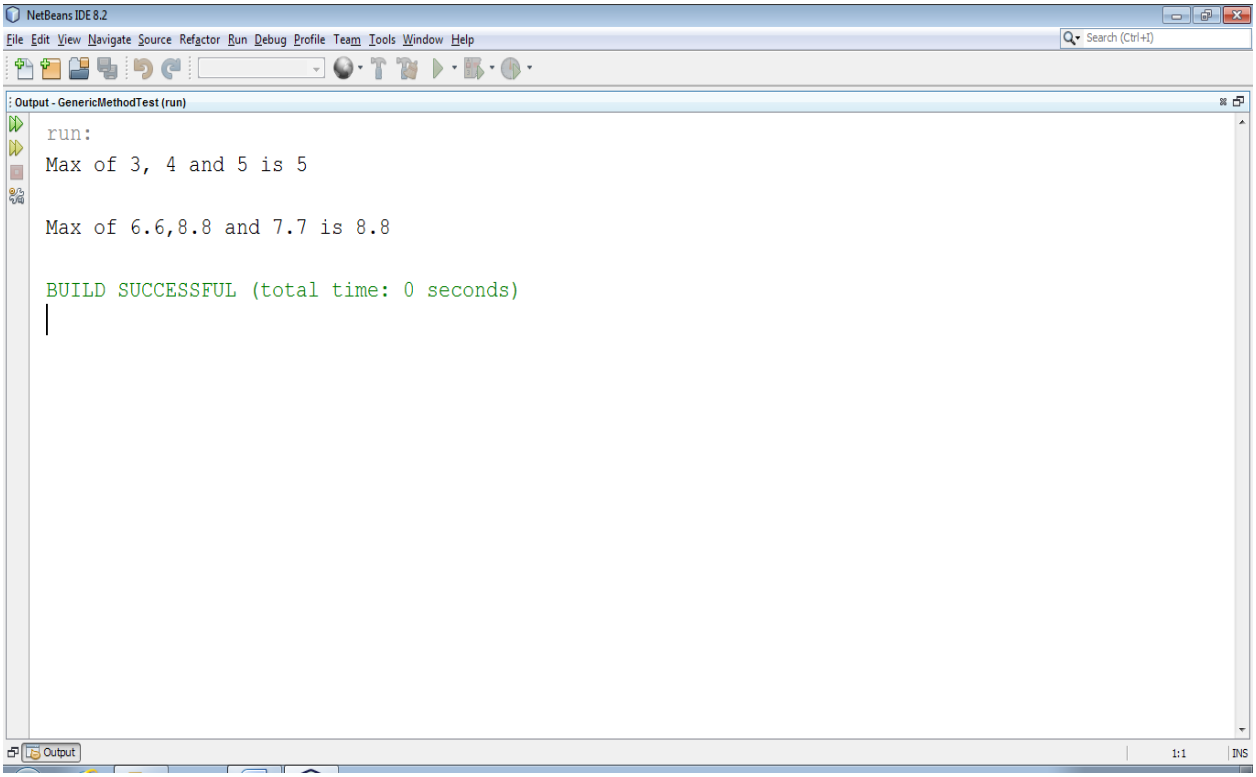
Step 1: Start the netbeansIDE8.2
Step 2: Goto FILE→ new project→java→java application→click next
Step 3: Give the name for the application→Click Finish.
Step 4: Create generic method class called T extends with three objects x,y,z.
Step 5: Initially assume x as max and compare it with y and z.
Step 6: Find the maximum and return it to the main function

PROGRAM:

```
package genericmethodtest;

public class GenericMethodTest {

  public static <T extends Comparable<T>> T maximum(T x, T y, T z)
 {

       T max = x;   // assume x is initially the largest

    if(y.compareTo(max) > 0) {
      max = y;   // y is the largest so far
    }

    if(z.compareTo(max) > 0) {
      max = z;   // z is the largest now
    }
    return max;   // returns the largest object
  }

  public static void main(String args[])
```

```
    {
        System.out.printf("Max of %d, %d and %d is %d\n\n",
            3, 4, 5, maximum( 3, 4, 5 ));

        System.out.printf("Max of %.1f,%.1f and %.1f is %.1f\n\n",
          6.6, 8.8, 7.7, maximum( 6.6, 8.8, 7.7 ));

      }
}
```

OUTPUT:



RESULT:

Thus the program for finding the maximum value using generic function has been written and executed successfully.

EXPT: 11
DATE:

CALCULATOR

AIM:

To write a Java program to implement the decimal and scientific calculation using event driven programming .

ALGORITHM:

Step 1: Start the program
Step 2: Open the notepad and type the program and save the program as ScientificCalculator.java
Step 3:Create the class ScientificCalculator. Define and declare its variables.
Step 4: Using ScientificCalculator constructor create bottons.
Step 5: Using actionPerformed() method define the function that has to be done when the corresponding button is pressed.
Step 6: Click on the Cmd Prompt → cd C:\Java\jdk1.8\bin
Step 7: Now compile the Filedemo.java using
javac ScientificCalculator.java
Step 8: Execute the program using
java ScientificCalculator

PROGRAM:

```
import java.awt.*;
import javax.swing.*;
import java.awt.event.*;
import javax.swing.event.*;
public class ScientificCalculator extends JFrame implements ActionListener
{
        JTextField tfield;

        double temp,temp1,result,a,ml;
        static double m1,m2;
        int k=1,x=0,y=0,z=0;
        char ch;
```

```
JButton b1,b2,b3,b4,b5,b6,b7,b8,b9,zero,clr,pow2,pow3,exp,fac,plus,min,div,log,
rec,mul,eq,addsub,dot,mr,mc,mp,mm,sqrt,sin,cos,tan;
        Container cont;
        JPanel textpanel,buttonpanel;
        ScientificCalculator()
        {
                cont=getContentPane();
                cont.setLayout(new BorderLayout());
           JPanel textpanel=new JPanel();
           tfield=new JTextField(25);
           tfield.setHorizontalAlignment(SwingConstants.RIGHT);
           tfield.addKeyListener(new KeyAdapter()
           {
                public void keyTyped(KeyEvent keyevent)
                {
                        char c=keyevent.getKeyChar();
                        if(c>='0'&&c<='9')
                        {
                        }
                        else
                        {
                                keyevent.consume();
                        }
                }
           });
        textpanel.add(tfield);
        buttonpanel=new JPanel();
        buttonpanel.setLayout(new GridLayout(8,4,2,2));
        boolean t=true;
        mr=new JButton("MR");
        buttonpanel.add(mr);
        mr.addActionListener(this);
        mc=new JButton("MC");
        buttonpanel.add(mc);
        mc.addActionListener(this);
        mp=new JButton("M+");
        buttonpanel.add(mp);
        mp.addActionListener(this);
        mm=new JButton("M-");
        buttonpanel.add(mm);
```

```
mm.addActionListener(this);
b1=new JButton("1");
buttonpanel.add(b1);
b1.addActionListener(this);
b2=new JButton("2");
buttonpanel.add(b2);
b2.addActionListener(this);
b3=new JButton("3");
buttonpanel.add(b3);
b3.addActionListener(this);
b4=new JButton("4");
buttonpanel.add(b4);
b4.addActionListener(this);
b5=new JButton("5");
buttonpanel.add(b5);
b5.addActionListener(this);
b6=new JButton("6");
buttonpanel.add(b6);
b6.addActionListener(this);
b7=new JButton("7");
buttonpanel.add(b7);
b7.addActionListener(this);
b8=new JButton("8");
buttonpanel.add(b8);
b8.addActionListener(this);
b9=new JButton("9");
buttonpanel.add(b9);
b9.addActionListener(this);
zero=new JButton("0");
buttonpanel.add(zero);
zero.addActionListener(this);
plus=new JButton("+");
buttonpanel.add(plus);
plus.addActionListener(this);
min=new JButton("-");
buttonpanel.add(min);
min.addActionListener(this);
mul=new JButton("*");
buttonpanel.add(mul);
mul.addActionListener(this);
```

```
div=new JButton("/");
buttonpanel.add(div);
div.addActionListener(this);
addsub=new JButton("+/-");
buttonpanel.add(addsub);
addsub.addActionListener(this);
dot=new JButton(".");
buttonpanel.add(dot);
dot.addActionListener(this);
eq=new JButton("=");
buttonpanel.add(eq);
eq.addActionListener(this);
rec=new JButton("1/x");
buttonpanel.add(rec);
rec.addActionListener(this);
sqrt=new JButton("Sqrt");
buttonpanel.add(sqrt);
sqrt.addActionListener(this);
log=new JButton("log");
buttonpanel.add(log);
log.addActionListener(this);
sin=new JButton("SIN");
buttonpanel.add(sin);
sin.addActionListener(this);
cos=new JButton("COS");
buttonpanel.add(cos);
cos.addActionListener(this);
tan=new JButton("TAN");
buttonpanel.add(tan);
tan.addActionListener(this);
pow2=new JButton("x^2");
buttonpanel.add(pow2);
pow2.addActionListener(this);
pow3=new JButton("X^3");
buttonpanel.add(pow3);
pow3.addActionListener(this);
exp=new JButton("Exp");
buttonpanel.add(exp);
exp.addActionListener(this);
fac=new JButton("n!");
```

```
 buttonpanel.add(fac);
 fac.addActionListener(this);
 clr=new JButton("AC");
 buttonpanel.add(clr);
 clr.addActionListener(this);
 cont.add("Center",buttonpanel);
 cont.add("North",textpanel);
setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
 }
 public void actionPerformed(ActionEvent e)
 {
        String s=e.getActionCommand();
        if(s.equals("1"))
        {
            if(z==0)
            {
                tfield.setText(tfield.getText()+"1");
            }
            else
            {
                tfield.setText("");
                tfield.setText(tfield.getText()+"1");
                z=0;
            }
        }
        if(s.equals("2"))
        {
            if(z==0)
            {
                tfield.setText(tfield.getText()+"2");
            }
            else
            {
                tfield.setText("");
                tfield.setText(tfield.getText()+"2");
                z=0;
            }
        }
        if(s.equals("3"))
        {
```

```
            if(z==0)
            {
                  tfield.setText(tfield.getText()+"3");
            }
            else
            {
                  tfield.setText("");
                  tfield.setText(tfield.getText()+"3");
                  z=0;
            }
      }
      if(s.equals("4"))
      {
            if(z==0)
            {
                  tfield.setText(tfield.getText()+"4");
            }
            else
            {
                  tfield.setText("");
                  tfield.setText(tfield.getText()+"4");
                  z=0;
            }
      }
      if(s.equals("5"))
      {
            if(z==0)
            {
                  tfield.setText(tfield.getText()+"5");
            }
            else
            {
                  tfield.setText("");
                  tfield.setText(tfield.getText()+"5");
                  z=0;
            }
      }
      if(s.equals("6"))
      {
            if(z==0)
```

```
		{
			tfield.setText(tfield.getText()+"6");
		}
		else
		{
			tfield.setText("");
			tfield.setText(tfield.getText()+"6");
			z=0;
		}
	}
	if(s.equals("7"))
	{
		if(z==0)
		{
			tfield.setText(tfield.getText()+"7");
		}
		else
		{
			tfield.setText("");
			tfield.setText(tfield.getText()+"7");
			z=0;
		}
	}
	if(s.equals("8"))
	{
		if(z==0)
		{
			tfield.setText(tfield.getText()+"8");
		}
		else
		{
			tfield.setText("");
			tfield.setText(tfield.getText()+"8");
			z=0;
		}
	}
	if(s.equals("9"))
	{
		if(z==0)
		{
```

```
                tfield.setText(tfield.getText()+"9");
        }
        else
        {
                tfield.setText("");
                tfield.setText(tfield.getText()+"9");
                z=0;
        }
}
if(s.equals("0"))
{
        if(z==0)
        {
                tfield.setText(tfield.getText()+"0");
        }
        else
        {
                tfield.setText("");
                tfield.setText(tfield.getText()+"0");
                z=0;
        }
}
if(s.equals("AC"))
{
                tfield.setText("");
                x=0;y=0;
                z=0;
        }
if(s.equals("log"))
{
        if(tfield.getText().equals(""))
        {
                tfield.setText("");
        }
        else
        {
           a=Math.log(Double.parseDouble(tfield.getText()));
                tfield.setText("");
                tfield.setText(tfield.getText()+a);
```

```
        }
    }
    if(s.equals("1/x"))
    {
        if(tfield.getText().equals(""))
        {
            tfield.setText("");
        }
        else
        {
           a=1/(Double.parseDouble(tfield.getText()));
            tfield.setText("");
            tfield.setText(tfield.getText()+a);
        }
    }
    if(s.equals("Exp"))
    {
        if(tfield.getText().equals(""))
        {
            tfield.setText("");
        }
        else
        {
           a=Math.exp(Double.parseDouble(tfield.getText()));
            tfield.setText("");
            tfield.setText(tfield.getText()+a);
        }
    }
    if(s.equals("x^2"))
    {
        if(tfield.getText().equals(""))
        {
            tfield.setText("");
        }
        else
        {
           a=Math.pow(Double.parseDouble(tfield.getText()),2);
            tfield.setText("");
            tfield.setText(tfield.getText()+a);
        }
```

```
}
if(s.equals("X^3"))
{
        if(tfield.getText().equals(""))
        {
                tfield.setText("");
        }
        else
        {
           a=Math.pow(Double.parseDouble(tfield.getText()),3);
                tfield.setText("");
                tfield.setText(tfield.getText()+a);
        }
}
if(s.equals("+/-"))
{
        if(x==0)
        {
                tfield.setText("-"+tfield.getText());
                x=1;
        }
        else
        {
           tfield.setText(tfield.getText());
        }
}
if(s.equals("."))
{
        if(y==0)
        {
                tfield.setText(tfield.getText()+".");
                y=1;
        }
        else
        {
           tfield.setText(tfield.getText());
        }
}
if(s.equals("+"))
{
```

```
            if(tfield.getText().equals(""))
            {
                  tfield.setText("");
                  temp=0;
                  ch='+';
            }
            else
            {
               temp=Double.parseDouble(tfield.getText());
                  tfield.setText("");
                  ch='+';
                  y=0;x=0;
            }
            tfield.requestFocus();
      }
      if(s.equals("-"))
      {
            if(tfield.getText().equals(""))
            {
                  tfield.setText("");
                  temp=0;
                  ch='-';
            }
            else
            {
                        y=0;x=0;
               temp=Double.parseDouble(tfield.getText());
                  tfield.setText("");
                  ch='-';
            }
            tfield.requestFocus();
      }
      if(s.equals("/"))
      {
            if(tfield.getText().equals(""))
            {
                  tfield.setText("");
                  temp=1;
                  ch='/';
            }
```

```
            else
            {
                        y=0;x=0;
               temp=Double.parseDouble(tfield.getText());
                  ch='/';
                  tfield.setText("");
            }
            tfield.requestFocus();
      }
      if(s.equals("*"))
      {
            if(tfield.getText().equals(""))
            {
                  tfield.setText("");
                  temp=1;
                  ch='*';
            }
            else
            {
                        y=0;x=0;
               temp=Double.parseDouble(tfield.getText());
                  ch='*';
                  tfield.setText("");
            }
            tfield.requestFocus();
      }
      if(s.equals("MC"))
      {
            ml=0;
            tfield.setText("");
      }
      if(s.equals("MR"))
      {
        tfield.setText("");
        tfield.setText(tfield.getText()+ml);
      }
      if(s.equals("M+"))
      {
            if(k==1)
            {
```

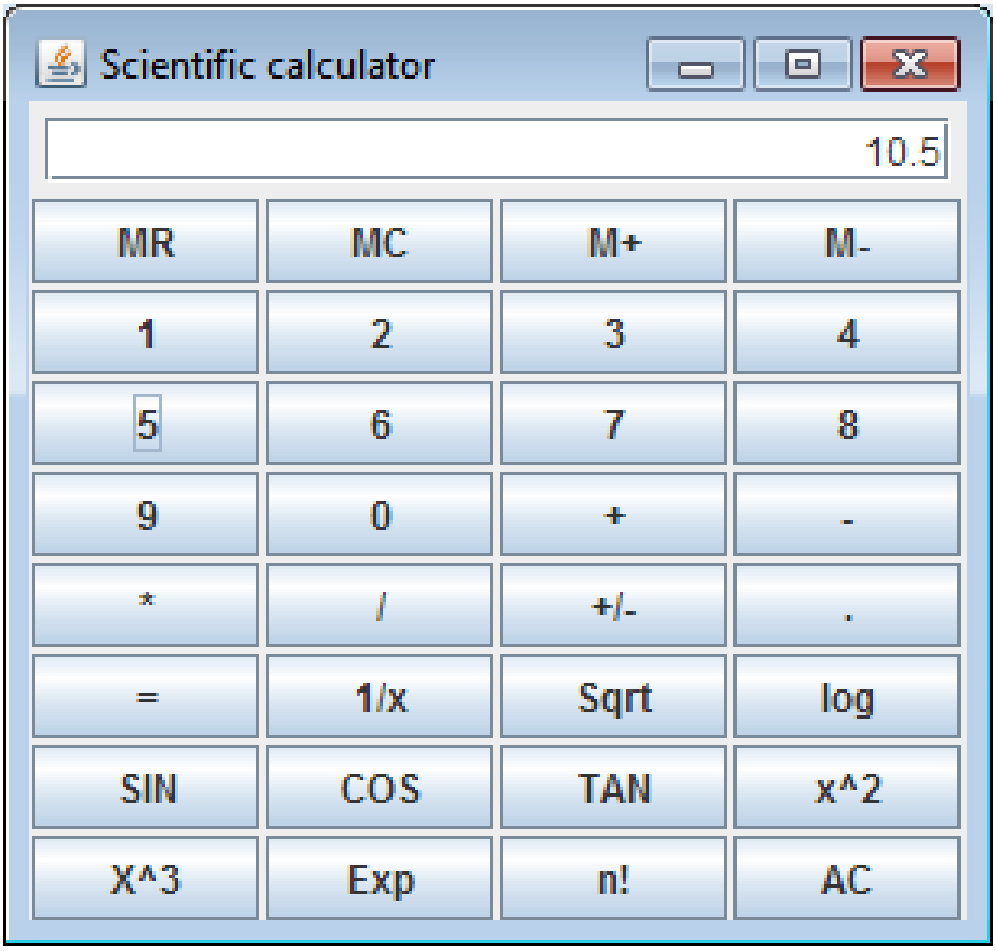
```
                ml=Double.parseDouble(tfield.getText());
                k++;
            }
            else
            {
                ml+=Double.parseDouble(tfield.getText());
                tfield.setText(""+ml);
            }
        }
        if(s.equals("M-"))
        {
            if(k==1)
            {
                ml=Double.parseDouble(tfield.getText());
                k++;
            }
            else
            {
                ml-=Double.parseDouble(tfield.getText());
                tfield.setText(""+ml);
            }
        }
        if(s.equals("Sqrt"))
        {
            if(tfield.getText().equals(""))
            {
                tfield.setText("");
            }
            else
            {
               a=Math.sqrt(Double.parseDouble(tfield.getText()));
                tfield.setText("");
                tfield.setText(tfield.getText()+a);

            }
        }
        if(s.equals("SIN"))
        {
            if(tfield.getText().equals(""))
            {
```

```
                tfield.setText("");
            }
            else
            {
               a=Math.sin(Double.parseDouble(tfield.getText()));
                tfield.setText("");
                tfield.setText(tfield.getText()+a);
            }
        }
        if(s.equals("COS"))
        {
            if(tfield.getText().equals(""))
            {
                tfield.setText("");
            }
            else
            {
               a=Math.cos(Double.parseDouble(tfield.getText()));
                tfield.setText("");
                tfield.setText(tfield.getText()+a);
            }
        }
        if(s.equals("TAN"))
        {
            if(tfield.getText().equals(""))
            {
                tfield.setText("");
            }
            else
            {
               a=Math.tan(Double.parseDouble(tfield.getText()));
                tfield.setText("");
                tfield.setText(tfield.getText()+a);
            }
        }
        if(s.equals("="))
        {
            if(tfield.getText().equals(""))
            {
                tfield.setText("");
```

```
                }
                else
                {
                        temp1=Double.parseDouble(tfield.getText());
                        switch(ch)
                        {
                                case '+':
                                        result=temp+temp1;
                                        break;
                           case '-':
                                        result=temp-temp1;
                                        break;
                                case '/':
                                        result=temp/temp1;
                                        break;
                                case '*':
                                        result=temp*temp1;
                                        break;
                        }
                tfield.setText("");
                tfield.setText(tfield.getText()+result);
                z=1;
                   }
            }
            if(s.equals("n!"))
            {
                if(tfield.getText().equals(""))
                {
                        tfield.setText("");
                }
                else
                {
                   a=fact(Double.parseDouble(tfield.getText()));
                        tfield.setText("");
                        tfield.setText(tfield.getText()+a);
                }
            tfield.requestFocus();
            }
    }
    double fact(double x)
```

```
        {
                /*int er=0;
                if(x>0)
                {
                        er=20;
                        return 0;
                }*/
                double i,s=1;
                for(i=2;i<=x;i+=1.0)
                  s*=i;
                  return s;
        }
   public static void main(String srgs[])
   {
        /*try
        {

UIManager.setLookAndFeel("com.sun.java.swing.plaf.windows.WindowsLookA
ndFeel");
        }
        catch(Exception e)
        {
        /*/       ScientificCalculator f;
                f=new ScientificCalculator();
                f.setTitle("Scientific calculator");
                f.pack();
                f.setVisible(true);
   /*   }   */
   }
        }
```

OUTPUT:



RESULT:

Thus the calculator program has been written and executed successfully.

EXPT: 12
DATE:

MINIPROJECT (ONLINE QUIZ SYSTEM)

OBJECTIVE:

It provides a common platform to connect student and teacher online. The registered teacher can create Quiz and student can take quiz and can asses himself/herself.

Users of the System

1. Teacher
2. Student

Functional Requirements

1. Teacher

1. Can create quiz after getting logged in!
2. Can enter subjects and enter question with it?s options and answer at the time of creating quiz.
3. 10 Question for each quiz required to be completed.

2. Student

1. Can search quiz according to their interest.
2. Click on the id of quiz and ready to start it just clicking on a button.
3. After completing all questions, result will be diaplayed Automatically.
4. Can view the description about each and every question in the respective quiz.

Non-Functional Requirements

1. Secure access of confidential data (user?s details). SSL can be used.
2. 24 X 7 availability
3. Browser testing and support for IE, NN, Mozila, and Firefox
4. Reports exportable in .XLS, .PDF
5. Create a detailed UML diagram (Component, Sequence, Class) for the system and its sub-components

User Interface Priorities

1. Professional look and feel
2. Use of AJAX atleast with all registration forms and with every search option and at the id of each searched result with onmouseover event.

Tools to be used

1. Use any IDE to develop the project. It may be Myeclipse / Eclipse / Netbeanse.
2. Oracle 10g for the database.
3. Server: Apache Tomcat/JBoss/Glassfish/Weblogic/Websphere.

Front End and Back End

1. **Front End:** JSP, JDBC, Javascript, AJAX
2. **Back End:** Oracle

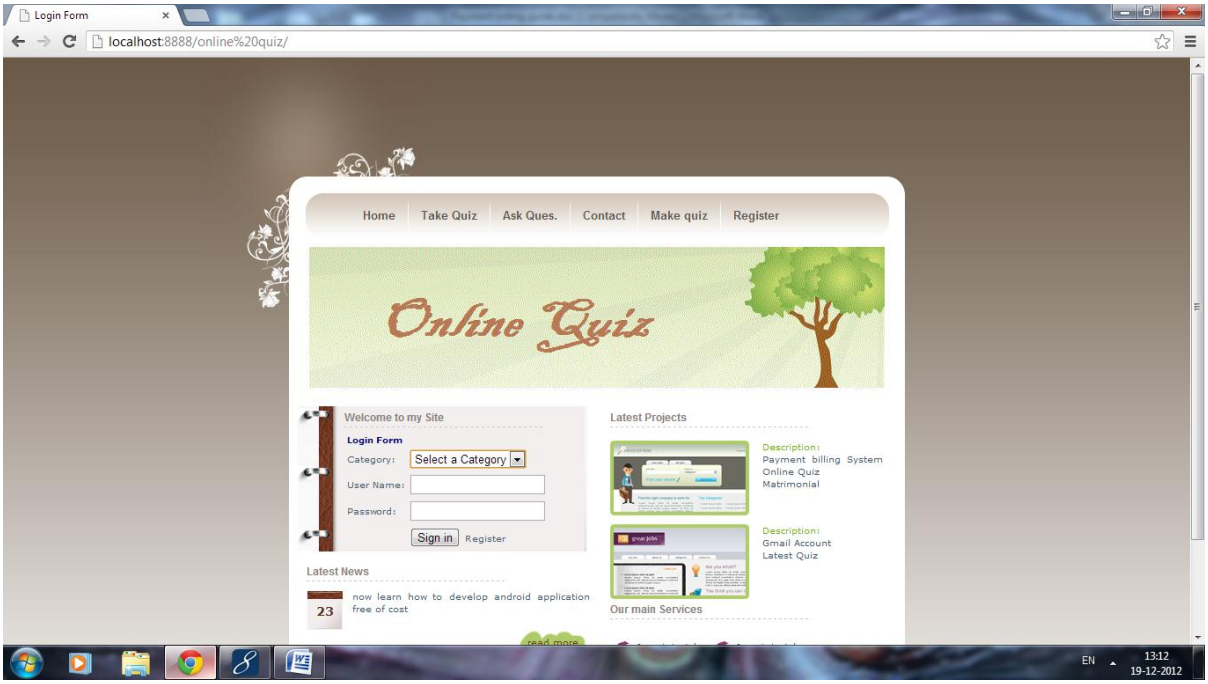
SOURCE PACKAGE:

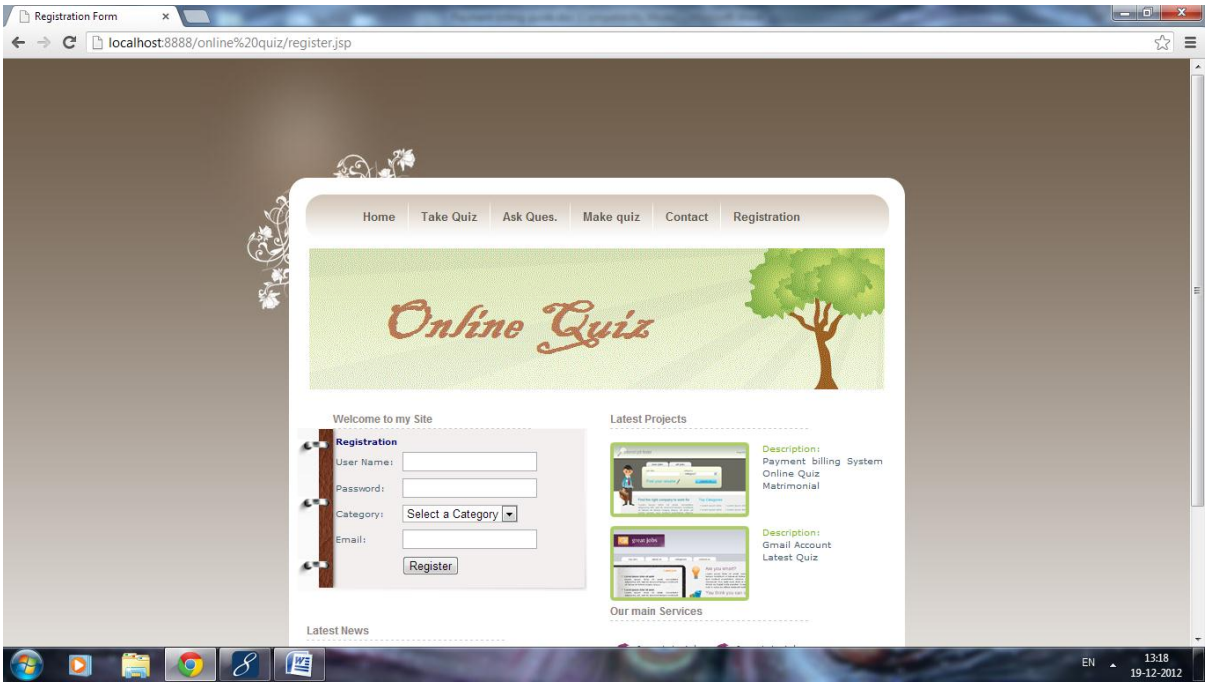
```
package com.javatpoint;

import javax.servlet.*;

import java.sql.*;


public class MyListener implements ServletContextListener{


    public void contextInitialized(ServletContextEvent arg0) {


        Connection con=null;

    try{

        ResultSet rs;
```

```
Class.forName("oracle.jdbc.driver.OracleDriver");

con=DriverManager.getConnection("jdbc:oracle:thin:@localhost:1521:xe","syste
m","oracle");

PreparedStatement ps2= con.prepareStatement("CREATE SEQUENCE
JAVATPOINT MINVALUE 1 MAXVALUE 999999999 INCREMENT BY 1 START
WITH 1 NOCACHE NOORDER NOCYCLE");

ps2.executeUpdate();

PreparedStatement ps=con.prepareStatement("CREATE TABLE
QUIZCONTACT (NAME VARCHAR2(4000),EMAIL VARCHAR2(4000),PHONE
VARCHAR2(4000),MESSAGE VARCHAR2(4000))");

ps.executeUpdate();

PreparedStatement ps4=con.prepareStatement("CREATE TABLE
QUIZINFO (SUBJECT VARCHAR2(4000),QUIZNAME VARCHAR2(4000))");

ps4.executeUpdate();


PreparedStatement  ps5=con.prepareStatement("CREATE TABLE
QUIZQ(NAME VARCHAR2(4000),EMAIL VARCHAR2(4000),PHONE
VARCHAR2(4000),QUESTION VARCHAR2(4000))");

ps5.executeUpdate();


ps5= con.prepareStatement("CREATE TABLE  QUIZQUES(QUESTION
VARCHAR2(4000),OPTION1 VARCHAR2(4000),OPTION2
VARCHAR2(4000),OPTION3 VARCHAR2(4000),OPTION4
VARCHAR2(4000),ANSWER VARCHAR2(4000),QUIZNAME
VARCHAR2(4000),QID VARCHAR2(4000),DESCRIPTION
VARCHAR2(4000),CONSTRAINT QUIZQUES_PK PRIMARY KEY (QID)
ENABLE)");
```

```
            ps5.executeUpdate();

            ps5= con.prepareStatement("CREATE TABLE  QUIZREGISTER
(USERNAME VARCHAR2(4000),USERPASS VARCHAR2(4000),CATEGORY
VARCHAR2(4000),EMAIL VARCHAR2(4000))");

            ps5.executeUpdate();

            Statement stmt=con.createStatement();

            stmt.executeUpdate("CREATE TRIGGER  BI_QUIZINFO before insert
on QUIZINFO for each row begin select JAVATPOINT.nextval into
:NEW.QUIZNAME from dual;end");

            stmt.executeUpdate("CREATE TRIGGER  BI_QUIZQUES before insert
on QUIZQUES for each row begin select JAVATPOINT.nextval into :NEW.QID from
dual;end");

            }

               catch(Exception e){

            e.printStackTrace();


        }

        }

               public void contextDestroyed(ServletContextEvent arg0) {

            System.out.println("project undeployed");


    }

}
```

OUTPUT:





RESULT:

Thus the mini project has been executed successfully.

EXPT: 13
DATE:

CONTENT BEYOND THE SYLLABUS

2-D SHAPES

AIM:

To write a Java program to implement 2-D shapes .

ALGORITHM:

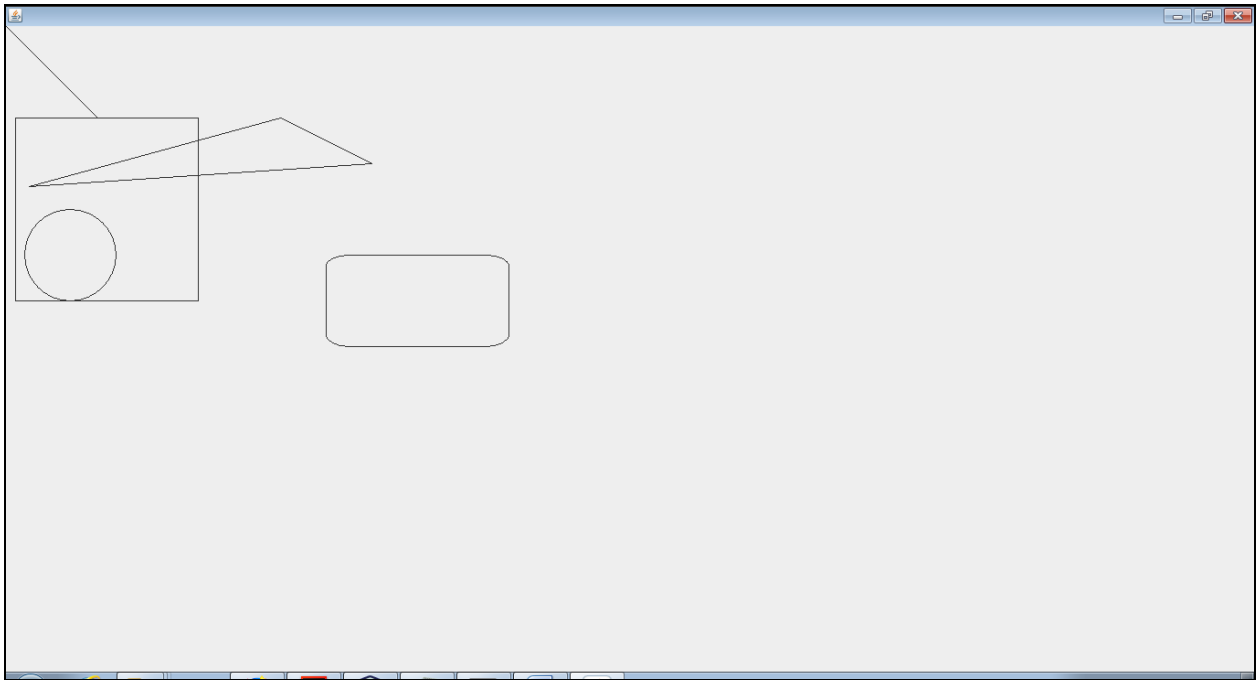
Step 1: Start the program
Step 2: Open the notepad and type the program and save the program as
Draw2DObjects.java
Step 3: Import graphics and geometric packages.
Step 4: Create the class Draw2DObjects. Define and declare its variables.
Step 5: Click on the Cmd Prompt → cd C:\Java\jdk1.8\bin
Step 6: Now compile the Filedemo.java using
javac Draw2DObjects.java
Step 7: Execute the program using
java Draw2DObjects

PROGRAM:

```
import java.awt.Canvas;
import java.awt.Graphics;
import java.awt.Graphics2D;
import java.awt.Shape;
import java.awt.geom.Ellipse2D;
import java.awt.geom.GeneralPath;
import java.awt.geom.Line2D;
import java.awt.geom.Rectangle2D;
import java.awt.geom.RoundRectangle2D;

import javax.swing.JFrame;

public class Draw2DObjects extends JFrame {
  Shape shapes[] = new Shape[5];
```

```
    public static void main(String args[]) {
      Draw2DObjects app = new Draw2DObjects();
    }

    public Draw2DObjects() {
      add("Center", new MyCanvas());
      shapes[0] = new Line2D.Double(0.0, 0.0, 100.0, 100.0);
      shapes[1] = new Rectangle2D.Double(10.0, 100.0, 200.0, 200.0);
      shapes[2] = new Ellipse2D.Double(20.0, 200.0, 100.0, 100.0);
      GeneralPath path = new GeneralPath(new Line2D.Double(300.0, 100.0, 400.0,
150.0));
      path.append(new Line2D.Double(25.0, 175.0, 300.0, 100.0), true);
      shapes[3] = path;
      shapes[4] = new RoundRectangle2D.Double(350.0, 250, 200.0, 100.0, 50.0,
25.0);
      setSize(400, 400);
      setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
      setVisible(true);
    }

    class MyCanvas extends Canvas {
      public void paint(Graphics graphics) {
        Graphics2D g = (Graphics2D) graphics;
        for (int i = 0; i < shapes.length; ++i) {
          if (shapes[i] != null)
            g.draw(shapes[i]);
        }
      }
    }
  }
```

OUTPUT:



RESULT:

Thus the 2-D shapes program has been written and executed successfully.