DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

OBJECT ORIENTED PROGRAMMING WITH JAVA

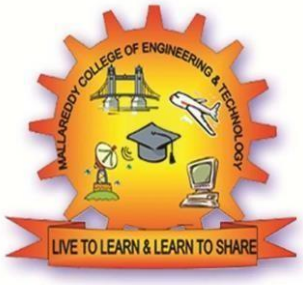
LAB MANUAL

(R22A0586)

B. TECH CSE

(II YEAR – II SEM)

R22 REGULATION
(2023-24)



Name : _____

Roll no: _____

Section: _____

Year : _____

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)
Recognized under 2(f) and 12 (B) of UGC ACT 1956
(Affiliated to JNTUH, Hyderabad, Approved by AICTE - Accredited by NBA &NAAC – 'A' Grade - ISO 9001:2015 Certified)
Maisammaguda, Dhulapally (Post Via. Hakimpet), Secunderabad – 500100,
Telangana State, India

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Vision

To acknowledge quality education and instill high patterns of discipline making the students technologically superior and ethically strong which involves the improvement in the quality of life in human race.

Mission

- To achieve and impart holistic technical education using the best of infrastructure, outstanding technical and teaching expertise to establish the students in to competent and confident engineers.
- Evolving the center of excellence through creative and innovative teaching learning practices for promoting academic achievement to produce internationally accepted competitive and world class professionals.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1 – ANALYTICAL SKILLS

- To facilitate the graduates with the ability to visualize, gather information, articulate, analyze, solve complex problems, and make decisions. These are essential to address thechallenges of complex and computation intensive problems increasing their productivity.

PEO2 – TECHNICAL SKILLS

- To facilitate the graduates with the technical skills that prepare them for immediate employment and pursue certification providing a deeper understanding of the technology in advanced areas of computer science and related fields, thus encouraging to pursue higher education and research based on their interest.

PEO3 – SOFT SKILLS

- To facilitate the graduates with the soft skills that include fulfilling the mission, setting goals, showing self-confidence by communicating effectively, having a positive attitude, get involved in team-work, being a leader, managing their career and their life.

PEO4 – PROFESSIONAL ETHICS

- To facilitate the graduates with the knowledge of professional and ethical responsibilities by paying attention to grooming, being conservative with style, following dress codes, safety codes, and adapting themselves to technological advancements.

PROGRAM SPECIFIC OUTCOMES (PSOs)

After the completion of the course, B. Tech Computer Science andEngineering,the graduates will have the following Program Specific Outcomes:

1. Fundamentals and critical knowledge of the Computer System:- Able to Understand the working principles of the computer System and its components , Apply the knowledge to build, asses, and analyze the software and hardware aspects of it .

2. The comprehensive and Applicative knowledge of Software Development: Comprehensive skills of Programming Languages, Software process models, methodologies, and able to plan, develop, test, analyze, and managethe software and hardware intensive systems in heterogeneous platforms individually or working in teams.

3. Applications of Computing Domain & Research: Able to use the professional, managerial, interdisciplinary skill set, and domain specific tools in development processes, identify the research gaps, and provide innovative solutions to them.

PROGRAM OUTCOMES (POs)

Engineering Graduates should possess the following:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design / development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis ofthe information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and needfor sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi disciplinary environments.

12 .Life- long learning: Recognize the need for,and have the preparation and ability to engage independent and life-long learning in the broadest context of technological change.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

Maisammaguda, Dhulapally Post, Via Hakimpet, Secunderabad – 500100

GENERAL LABORATORY INSTRUCTIONS

1. Students are advised to come to the laboratory at least 5 minutes before (to the starting time), those who come after 5 minutes will not be allowed into the lab.
2. Plan your task properly much before to the commencement, come prepared to the lab with the synopsis / program / experiment details.
3. Student should enter into the laboratory with:
    a. Laboratory observation notes with all the details (Problem statement, Aim, Algorithm, Procedure, Program, Expected Output, etc.,) filled in for the lab session.
    b. Laboratory Record updated up to the last session experiments and other utensils (ifany) needed in the lab.
    c. Proper Dress code and Identity card.
4. Sign in the laboratory login register, write the TIME-IN, and occupy the computer system allotted to you by the faculty.
5. Execute your task in the laboratory, and record the results / output in the lab observation note book, and get certified by the concerned faculty.
6. All the students should be polite and cooperative with the laboratory staff, must maintain the discipline and decency in the laboratory.
7. Computer labs are established with sophisticated and high end branded systems, which should be utilized properly.
8. Students / Faculty must keep their mobile phones in SWITCHED OFF mode during the lab sessions. Misuse of the equipment, misbehaviors with the staff and systems etc., will attract severe punishment.
9. Students must take the permission of the faculty in case of any urgency to go out; if anybody found loitering outside the lab / class without permission during workinghourswill be treated seriously and punished appropriately.
10. Students should LOG OFF/ SHUT DOWN the computer system before he/she leaves the lab after completing the task (experiment) in all aspects. He/she must ensure the system / seat is kept properly.

HEAD OF THE DEPARTMENT **PRINCIPAL**

INDEX

PROGRAM-1

Aim: Write a java program to find the Fibonacci series using recursive and non recursive functions:

```
//Class to write the recursive and non recursive functions.
class fib
{
int a,b,c;
//Non recursive function tofind theFibonacci series.
void nonrecursive(int n)
{ a=0; b=1;
c=a+b;
System.out.print(b);
while(c<=n)
{
System.out.print(c);
a=b;
b=c;
c=a+b;
}
}
// Recursive function to find the Fibonacci series. int recursive(int n)
{
if(n==0) return (0);
if(n==1)  return (1);
else
 return(recursive(n-1)+recursive(n-2));
}
}
```

```
// Class that calls recursive and non recursive functions
class fib1
{
public static void main(String args[])
{
int n;
// Accepting the value of n at run time.
n=Integer.parseInt(args[0]);
System.out.println("the recursion using non recursive is"); // Creating object for the fib class.
fib f=newfib();
// Calling non recursive function of fib class.
f.nonrecursive(n);
System.out.println("the recursion using recursive is");
for(int i=0;i<=n;i++)
{
// Calling recursive function of fib class. int F1=f.recursive(i); System.out.print(F1);
}}}
```

Three Test Outputs:

Signature of the faculty

EXERCISE:

Write a java program to print the multiplication table.

Write a java program to find the Factorial of a given integer using recursive and non recursive functions

PROGRAM-2 Write a java program to multiply two given matrices.

```
// Class to find multiplication of matrices.
class matri
{
public static void main(String args[])
{
// Accept the number of rows and columns at run time. int
m=Integer.parseInt(args[0]);
int n=Integer.parseInt(args[1]);
// Initialize the arrays.
int a[][]=new int[m][n];
int b[][]=new int[m][n];
int c[][]=new int[m][n]; int i=2;
// Loop to accept the values into a matrix.
for(int j=0;j<m;j++)
{for(int k=0;k<n;k++)
{
a[j][k]=Integer.parseInt(args[i]); i++;
}
}
// Loop to accept the values into b matrix. for(int j=0;j<m;j++)
{
for(int k=0;k<n;k++)
{
b[j][k]=Integer.parseInt(args[i]);
i++;
}
}
// Loop to multiply two matrices .
```

```
for(int j=0;j<m;j++)
{
for(int k=0;k<n;k++)
{ c[j][k]=0;
for(int l=0;l<m;l++)
{
c[j][k]=c[j][k]+(a[j][l]*b[l][k]);
}
}
}
// Loop to display the result . for(int j=0;j<m;j++)
{
for(int k=0;k<n;k++)
{
System.out.print(c[j][k]);
}
System.out.println();
}
}
}
```

Three test outputs:

Signature of the faculty

PROGRAM-3 Write a java program that prompts the user for an integer and then printouts all prime numbers up tothat integer

```
import java.lang.*; class Prime
{
public static void main(String arg[])
{
int n,c,i,j; n=Integer.parseInt(arg[0]);
System.out.println("prime numbers are");
for(i=1;i<=n;i++)
{ c=0;
for(j=1;j<=i;j++)
{
if(i%j==0) c++;
}
if(c==2) System.out.println(""+i);
}
}
}
```

Three test outputs:

Signature of the faculty

EXERCISE:

1. Write a java program to find all even and odd integers up to a giveninteger.Write a java program to add and subtract two givenmatrices.
2. Write a java program that reads a line of integers and displays each integersand the product of allintegers use StringTokenizer.

PROGRAM -4 Write a java program that checks whether a given string is palindrome or not

Program:

```
// Class to find whether string is palindrome or not. class palindrome
{
public static void main(String args[])
{
// Accepting the string at run time. String
s=args[0];String s1="";
int l,j;
// Finding the length of the string. l=s.length();
// Loop to find the reverse of the string. for(j=l-1;j>=0;j--)
{
s1=s1+s.charAt(j);
}
// Condition to find whether two strings are equal // and display the message.
if(s.equals(s1))
System.out.println("String "+s+" is palindrome");
else
System.out.println("String "+s+" is not palindrome");
}

}
```

Three test outputs:

Signature of the faculty

EXERCISE:

1. Write a java program to sort the given integers in ascending/descending order.Write a java program to display characters in a string in sorted order.
2. Write a program that uses a sequence input stream to output the contents of two files.
3. Write a java program that reads a file and displays the file on the screen, with an asterisk mark before each line.
4. Write a java program that displays the number of characters, lines, words, white spaces in a text file.

PROGRAM-5 Write a java program to display the employee details using Scanner class

```
importjava.util.*;
class EmployeeDetails
{
public static void main(String args[])
{
System.out.println("entername,id,age,salary");
Scanner sc=newScanner(System.in);
String n=sc.next();
int i=sc.nextInt();
int a=sc.nextInt();
float s=sc.nextFloat();
System.out.println("name is"+n+"idis"+i+"ageis"+a+"salaryis"+s);
}
}
```

Three test Outputs:

Signature of the faculty

EXERCISE:

1. Write a java program to Read and display the student details using Scanner class.

PROGRAM-6 Write a java program that checks whether a given string is palindrome or not

```
class Palindrome
{
public static void main(String args[])
{
// Accepting the string at run time. String
s=args[0];
String s1=""; intl,j;
// Finding the length of the string.
 l=s.length();
// Loop to find the reverse of the string. for(j=l-1;j>=0;j--)
{
s1=s1+s.charAt(j);
}
// Condition to find whether two strings are equal
if(s.equals(s1))
System.out.println("String "+s+" is palindrome");
else
System.out.println("String "+s+" is not palindrome");
}
}
```

Three Test Outputs:

Signature of the faculty

PROGRAM-7A Write a java program to represent Abstract class with example

```
abstract class Shape
{
abstract void numberOfSides();
}
// Classes that illustrates the abstract method. class Trapezoid
{
voidnumberOfSides()
{
System.out.println("The no. of side's in trapezoidal are6");
} }
class Triangle
{
voidnumberOfSides()
{
System.out.println("The no. of side's in triangle are:3 ");
} }
classHexogon
{
voidnumberOfSides()
{ System.out.println("The no. of side's in hexogon are:6 ");
} }
// Class that create objects and call the method. classShapeDemo
{
public static void main(String args[])
{
Trapezoid obj1 = new Trapezoid(); Triangle obj2 = new Triangle(); Hexogon obj3 = new
Hexogon();obj1.numberOfSides(); obj2.numberOfSides(); obj3.numberOfSides(); }
}
```

Three Test Outputs:

Signature of the faculty

PROGRAM-7B Write a java program to implement Interface using extends keyword

```
class Person
    {
    String name; Person(String n)
    {
    name = "Person: " + n;
    }
    }
    interface Mother
    {
    public void FeedChildren();
    }
    interface Wife
    {
    public void CallHusband();
    }
    classWifeAndMother extends Person implements Wife, Mother
    {
    WifeAndMother(String n)
    {
    super(n);
    name = "Wife and mother: " + n;
    }
    public void FeedChildren()
    {
    System.out.println(name + " is feeding the children.");
    }
    public void CallHusband()
    {
    System.out.println(name + " is calling her husband.");
    }
    }
```

```
public class Test5
{
public static void main(String args[])
{
Person p = new Person("Kiran"); WifeAndMother w = new WifeAndMother("Radha");
System.out.println("p is a " + p.name); System.out.println("w is a " + w.name);
w.FeedChildren();w.CallHusband();
}
}
```

Three Test Outputs:

Signature of the faculty

PROGRAM-8 Write a java program to create user defined packagepackage pack;

```
public class A{
public void msg()
{System.out.println("Hello");}
}
import pack.*; class B{
public static void main(String args[])
{ A obj = new A();obj.msg();
}
}
```

Three Test Outputs:

Signature of the faculty

PROGRAM-8B Write a java program to create inner classes

```
class A
{
int  a=10;
void display()
{
B b=new B();
b.show();
}
class B
{
int b=20;
void show()
{
System.out.println(" a value is " +a);
System.out.println(" b value is " +b);
}
}
}
classInnerDemo
{
public static void main(String args[])
{
A a=new A(); a.display();
}
}
```

Three Test Outputs:

Signature of the faculty

PROGRAM-9A Write a java program for creating multiple catch blocks

```
public class MultipleCatchBlocks { public static void main(String[] args)
{try{
int a[]=new int[5]; a[5]=30/0;
}
catch(ArithmeticException e)
{
System.out.println("Arithmetic Exception occurs");
}
catch(ArrayIndexOutOfBoundsException e)
{
System.out.println("ArrayIndexOutOfBounds Exception occurs");
}
catch(Exception e)
{
System.out.println("Parent Exception occurs");
}
System.out.println("rest of the code");
}
}
```

Three Test Outputs:

Signature of the faculty

PROGRAM-9B Write a java program for producer and consumer problem using Threads

```
class InterThreadDemo
{
public static void main(String args[])
{
Producer p1=new Producer(); Consumer c1=new Consumer(p1); Thread t1=new
Thread(p1); Threadt2=new Thread(c1); t2.start();
t1.start();
}
}
class Producer extends Thread
{
StringBuffersb; Producer()
{
sb=new StringBuffer();
}
public voidrun()
{
synchronized(sb)
{
for(int i=0;i<=10;i++)
{
try
{
sb.append(i+":"); Thread.sleep(1000); System.out.println("appending");
}
catch(InterruptedException e)
{
System.out.println(e);
}
}
```

```
sb.notify();
}
}
}
class Consumer extends Thread
{
Producer prod; Consumer(Producer prod)
{
this.prod=prod;
}

public void run()
{
synchronized(prod.sb)
{
try
{
prod.sb.wait();
}
catch(Exception e)
{
System.out.println(e);
}
System.out.println(prod.sb);
}
}
}
```

Three Test Outputs:

Signature of the faculty

PROGRAM-10Write a Java program that implements a multi-thread application that has three threads

```
class Thread1 extends Thread
    {
    public void run()
    {
    for(int i=0;i<=5;i++)
    {
    System.out.println("Thread1:"+ i);
    }
    }
    }
    class Thread2 extends Thread
    {
    public void run()
    {
    for(int j=0;j<=5;j++)
    {
    System.out.println("Thread2:"+ j);
    }
    }
    }
    class Thread3 extends Thread
    {
    public void run()
    {
    for(int k=0;k<=5;k++)
    {
    System.out.println("Thread3:"+ k);
    }
    }
    }
```

```
classMultiThreadDemo
{
public static void main(String args[])
{
Thread1 t1=new Thread1(); Thread2 t2=new Thread2(); Thread3 t3=new Thread3();
t1.start();t2.start();
t3.start();
for(int i=0;i<=5;i++)
{
System.out.println("main thread:"+ i);
}
}
}
```

Three Test Outputs:

Signature of the faculty

PROGRAM-11A Write a java program to display File class properties

```
import java.io.*;
public class FileDemo2 {
public static void main(String[] args)
{ String fname=args[0];
File f=new File(fname);
System.out.println("path"+f.getPath());
System.out.println("parent"+f.getAbsolutePath());
System.out.println("parent"+f.getParent());
System.out.println("exits"+f.exists()); if(f.exists())
{
System.out.println("isWritable"+f.canWrite());
System.out.println("isReadable"+f.canRead());
System.out.println("isDirectory"+f.isDirectory());
System.out.println("size of the file"+f.length());
}
}
}
```

Three Test Outputs:

Signature of the faculty

PROGRAM-11B Write a java program to represent ArrayList class

```
import java.util.*;
class TestJavaCollection{ public static void main(String args[]){
ArrayList<String> list=new ArrayList<String>(); //Creating arraylist
list.add("Ravi");//Adding object inarraylist
list.add("Vijay");
list.add("Ravi");
list.add("Ajay");
//Traversing list through Iterator
Iterator itr=list.iterator();
while(itr.hasNext())
{System.out.println(itr.next());
}
}
}
```

Three test outputs

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Signature of the faculty

PROGRAM-11C Write a Java program loads phone no, name from a text file using hash table

```
import java.util.*;
 class HTDemo {
public static void main(String args[]) { Hashtable balance = new Hashtable();
Enumeration names;String str; doublebal;
balance.put("John Doe", new Double(3434.34));
balance.put("Tom Smith", new Double(123.22));
balance.put("Jane Baker", new Double(1378.00));
balance.put("Todd Hall", new Double(99.22));
balance.put("Ralph Smith", new Double(19.08));
// Show all balances in hash table.
names = balance.keys();
while(names.hasMoreElements()) {
str =(String) names.nextElement();
System.out.println(str + ": " + balance.get(str));
}
System.out.println();
// Deposit 1,000 into John Doe's account
bal = ((Double)balance.get("John Doe")).doubleValue();
balance.put("John Doe", new Double(bal+1000));
System.out.println("John Doe's new balance: " + balance.get("John Doe"));
}
```

Three test outputs

Signature of the faculty

PROGRAM-12 Write an applet program that displays a simple message

```
importjava.awt.*;
import java.applet.*;
/* <applet code="FirstApplet" width=200 height=300>
</applet>*/
public class FirstApplet extends Applet
{
public void init()
{
setBackground(Color.red);
}
public void paint(Graphics g)
{
g.drawString("this is first applet",50,30); showStatus("welcome");
}
}
```

Three test outputs:

Signature of the faculty

PROGRAM-13A Write a Java program compute factorial value using Applet

```
Import java.awt.*;
Import java.awt.event.*;
Import java.applet.*;
/*
<applet code="FactorialApplet" width=300 height=300>
</applet>
*/
public class FactorialApplet extends Applet implements ActionListener
{
Label L1,L2; TextField T1,T2; Button B1; public void init()
{
setLayout(new FlowLayout(FlowLayout.LEFT)); L1=new Label("enter the
value");add(L1);
T1=new TextField(10); add(T1);
L2=new Label("factorial valueis");
add(L2);T2=new TextField(10);
add(T2);
B1=new Button("compute"); add(B1); B1.addActionListener(this);
}
public void actionPerformed(ActionEvent e)
{
if(e.getSource()==B1)
{
int value=Integer.parseInt(T1.getText()); int fact=factorial(value); T2.setText(String.valueOf(fact));
}
}
int factorial(int n)
{
if(n==0) return 1; else
return n*factorial(n-1);
} }
```

Three test outputs:

Signature of the faculty

PROGRAM -13B Write a program for passing parameters using Applet

```
importjava.awt.*; importjava.applet.*;
/*
<applet code="MyApplet" width=200 height=300>
<param name="t1" value="Ravi"><param name="t2" value="102">
</applet>
*/
public class MyApplet extends Applet
{
String n; String
id;public void
init()
{
n=getParameter("t1"); id=getParameter("t2");
}
public void paint(Graphics g)
{
g.drawString("name is"+n,100,100); g.drawString("id is"+id,100,150);
}
}
```

Three test outputs:

Signature of the faculty

PROGRAM-14 Write a java program for handling Mouse events

```
importjava.awt.*;
importjava.awt.event.*;
importjava.applet.*;
    /*
    <applet code="MouseEvents" width=300 height=100>
    </applet>
    */
    public class MouseEvents extends Applet implements MouseListener,
    MouseMotionListener {String msg = "";
    intmouseX = 0, mouseY = 0; // coordinates of mouse public void init() {
    addMouseListener(this); addMouseMotionListener(this);
    }
    // Handle mouse clicked.
    public void mouseClicked(MouseEvent me) {
    // save coordinates mouseX =
    0;mouseY = 10;
    msg = "Mouse clicked."; repaint();
    }
    // Handle mouse entered.
    public void mouseEntered(MouseEvent me) {
    // save coordinates mouseX =
    0;mouseY = 10;
    msg = "Mouse entered."; repaint();
    }
    // Handle mouse exited.
    public void mouseExited(MouseEvent me) {
    // save coordinates mouseX =
    0;mouseY = 10;
```

```
msg = "Mouse exited."; repaint();
}

// Handle button pressed.
public void mousePressed(MouseEvent me) {
// save coordinates mouseX = me.getX(); mouseY = me.getY(); msg = "Down"; repaint();
}

// Handle button released.
public void mouseReleased(MouseEvent me) {
// save coordinates mouseX = me.getX(); mouseY = me.getY(); msg = "Up"; repaint();
}
// Handle mouse dragged.
public void mouseDragged(MouseEvent me) {
// save coordinates mouseX = me.getX(); mouseY = me.getY(); msg = "*";
showStatus("Dragging mouse at " + mouseX + ", " + mouseY); repaint();
}
// Handle mouse moved.
public void mouseMoved(MouseEvent me) {
// show status
showStatus("Moving mouse at " + me.getX() + ", " + me.getY());
}
// Display msg in applet window at current X,Y location. public void paint(Graphics
g) {g.drawString(msg, mouseX, mouseY);
}
}
```

Three test outputs:

14 B. Write a program for handling Key Events

```
importjava.awt.*;
 importjava.awt.event.*;
 importjava.applet.*;
/*
<applet code="SimpleKey" width=300 height=100>
</applet> */
public class SimpleKey extends Applet implements KeyListener {
String msg = "";int X = 10, Y = 20; // output coordinates
public void init() { addKeyListener(this);
requestFocus(); // request input focus
}
public void keyPressed(KeyEventke) {
showStatus("Key Down");
}
public void keyReleased(KeyEventke) {
showStatus("Key Up");
}
public void keyTyped(KeyEventke) {
msg += ke.getKeyChar();repaint();
}
// Display keystrokes.
public void paint(Graphics g) { g.drawString(msg, X, Y);
}
}
```

Three test outputs

PROGRAM-15 Write a java program that connects to a database using JDBCProgram:

```
import java.sql.Connection;
import java.sql.DriverManager;
public class PostgreSQLJDBC
{
public static void main(String args[])
{
Connection c = null; try {
Class.forName("org.postgresql.Driver");
c = DriverManager .getConnection("jdbc:postgresql://localhost:5432/testdb", "postgres", "123");
} catch (Exception e) { e.printStackTrace();
System.err.println(e.getClass().getName()+": "+e.getMessage());
System.exit(0);
}
System.out.println("Opened database successfully");
}
}
```

Three test outputs:

Signature of the faculty

PROGRAM-16A Write a java program to connect to a database using JDBC and insert values into it

```
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.Statement;
public classPostgreSQLJDBC
{
public static void main(String args[])
{
Connection c = null; Statement stmt = null; try {
Class.forName("org.postgresql.Driver");
c = DriverManager.getConnection("jdbc:postgresql://localhost:5432/testdb", "manisha", "123");
c.setAutoCommit(false);
System.out.println("Opened database successfully");
stmt = c.createStatement();
String sql = "INSERT INTO COMPANY (ID,NAME,AGE,ADDRESS,SALARY) "
+ "VALUES (1, 'Paul', 32, 'California', 20000.00 );";
stmt.executeUpdate(sql);

sql = "INSERT INTO COMPANY (ID,NAME,AGE,ADDRESS,SALARY) "
+ "VALUES (2, 'Allen', 25, 'Texas', 15000.00 );";  stmt.executeUpdate(sql);

sql = "INSERT INTO COMPANY (ID,NAME,AGE,ADDRESS,SALARY) "
+ "VALUES (3, 'Teddy', 23, 'Norway', 20000.00);"; stmt.executeUpdate(sql);

sql = "INSERT INTO COMPANY (ID,NAME,AGE,ADDRESS,SALARY) "
+ "VALUES (4, 'Mark', 25, 'Rich-Mond ', 65000.00 );"; stmt.executeUpdate(sql);
```

```
stmt.close();
c.commit();
c.close();
} catch (Exception e) {
System.err.println( e.getClass().getName()+": "+ e.getMessage()
);
System.exit(0);
}
System.out.println("Records created successfully");
}
}
```

Three test outputs:

Signature of the faculty

PROGRAM-16B Write a java program to connect to a database using JDBC and delete values from it

```
importjava.sql.Connection;
import java.sql.DriverManager;
import java.sql.ResultSet;
import java.sql.Statement;
public class PostgreSQLJDBC6 { public static void main( String args[])
{
Connection c = null; Statement stmt = null; try {
Class.forName("org.postgresql.Driver");
c = DriverManager.getConnection("jdbc:postgresql://localhost:5432/testdb", "manisha", "123");
c.setAutoCommit(false);
System.out.println("Opened database successfully");
stmt = c.createStatement();
String sql = "DELETE from COMPANY where ID=2;";
stmt.executeUpdate(sql);c.commit();
ResultSet rs = stmt.executeQuery( "SELECT * FROM COMPANY;");
while ( rs.next() ) {
int id = rs.getInt("id");
String name = rs.getString("name");
int age = rs.getInt("age");
String address = rs.getString("address");
float salary = rs.getFloat("salary");
System.out.println( "ID = " +id );
System.out.println( "NAME = " + name );
System.out.println( "AGE = " + age );
System.out.println( "ADDRESS = " + address );
System.out.println( "SALARY = " + salary );
System.out.println();
}
```

```
rs.close();
stmt.close();
c.close();
} catch ( Exception e ) {
System.err.println( e.getClass().getName()+": "+ e.getMessage()
);
System.exit(0);
}
System.out.println("Operation done successfully");
}
}
```

Three test outputs:

Signature of the faculty

PROGRAM-17 Write a java program that works as a simple calculator. Use a Grid Layout to arrange Buttons for digitsand for the + - * % operations. Add a text field to

```
importjava.awt.*;
importjava.awt.event.*;
importjava.applet.*;
importjavax.swing.*;
/*
<applet code="Calculator" width=300 height=300>
</applet>
*/
public class Calculator extends JAppletimplements ActionListener
{
String msg=""; int v1,v2,result; JTextField t1;
JButtonb[]=new JButton[10];
JButton add,sub,mul,div,clear,mod,EQ; char OP;
public void init()
{
Container contentPane = getContentPane();
contentPane.setLayout(new FlowLayout());
Color k=new Color(120,89,90);
setBackground(k);
t1=new JTextField(10);
GridLayoutgl=new GridLayout(4,5);
setLayout(gl);
for(int i=0;i<10;i++)
{
b[i]=new JButton(""+i);
}
add=new  JButton("add");
sub=new   JButton("sub");
mul=new JButton("mul");
```

```
div=new JButton("div");
mod=new JButton("mod");
clear=new JButton("clear");
EQ=new JButton("EQ");
t1.addActionListener(this);
add(t1);
for(int i=0;i<10;i++)
{
add(b[i]);
}
 contentPane.add(add);
contentPane.add(sub);
contentPane.add(mul);
contentPane.add(div);
contentPane.add(mod);
contentPane.add(clear);
contentPane.add(EQ);
for(int i=0;i<10;i++)
{
b[i].addActionListener(this);
}
add.addActionListener(this);
sub.addActionListener(this);
mul.addActionListener(this);
div.addActionListener(this);
mod.addActionListener(this);
clear.addActionListener(this);
EQ.addActionListener(this);
}
```

```
public void actionPerformed(ActionEventae)
{
String str=ae.getActionCommand();
charch=str.charAt(0);
if (Character.isDigit(ch)) t1.setText(t1.getText()+str);
elseif(str.equals("add"))
{
v1=Integer.parseInt(t1.getText());
OP='+';t1.setText("");
}
else if(str.equals("sub"))
{
v1=Integer.parseInt(t1.getText()); OP='-';
t1.setText("");
}
else if(str.equals("mul"))
{
v1=Integer.parseInt(t1.getText());
OP='*';t1.setText("");
}
else if(str.equals("div"))
{
v1=Integer.parseInt(t1.getText()); OP='/';
t1.setText("");
}
else if(str.equals("mod"))
{
v1=Integer.parseInt(t1.getText());
OP='%';
t1.setText("");
}
```

```
if(str.equals("EQ"))
{
v2=Integer.parseInt(t1.getText());
if(OP=='+')result=v1+v2; else if(OP=='-')
result=v1-v2; elseif(OP=='*')
result=v1*v2; else if(OP=='/')
result=v1/v2; else if(OP=='%')
result=v1%v2;
t1.setText(""+result);
}
if(str.equals("clear"))
{
t1.setText("");
}
}
}
```

Three test outputs:

Signature of the faculty