# JAVA  PROGRAMMING LABORATORY MANUAL

# FOR 5$^{\text{TH}}$  SEM IS AND CS

# (2011-2012)

## BY

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## PROGRAM 1

```
/* Write a Java Program to define a class, describe its constructor, overload
the Constructors and instantiate its object */

import java.lang.*;

class student
{
  String name;
  int regno;
  int marks1,marks2,marks3;
  // null constructor
  student()
   {
     name="raju";
     regno=12345;
     marks1=56;
     marks2=47;
     marks3=78;
    }
  // parameterized constructor
   student(String n,int r,int m1,int m2,int m3)
    {
     name=n;
     regno=r;
     marks1=m1;
     marks2=m2;
     marks3=m3;
    }
 // copy constructor
   student(student s)
    {
     name=s.name;
     regno=s.regno;
     marks1=s.marks1;
     marks2=s.marks2;
     marks3=s.marks3;
    }
   void display()
    {
    System.out.println(name + "\t" +regno+ "\t" +marks1+ "\t" +marks2+ "\t" + marks3);
    }
}

class studentdemo
{
  public static void main(String arg[])
   {
    student s1=new student();
```

```
        student s2=new student("john",34266,58,96,84);
        student s3=new student(s1);
        s1.display();
        s2.display();
        s3.display();
    }
}
```

***************************OUTPUT*********************************

c:\jdk1.6.0_26\bin>javac studentdemo.java

c:\jdk1.6.0_26\bin>java studentdemo

```
raju    12345   56      47      78
john    34266   58      96      84
raju    12345   56      47      78
```

## PROGRAM 2

/* Write a Java Program to define a class, define instance methods for setting and
Retrieving values of instance variables and instantiate its object.*/

```java
import java.lang.*;

class emp
 {
  String name;
  int id;
  String address;
  void getdata(String name,int id,String address)
   {
     this.name=name;
     this.id=id;
     this.address=address;
   }
  void putdata()
   {
     System.out.println("Employee details are :");
     System.out.println("Name :"   +name);
     System.out.println("ID   :"   +id);
     System.out.println("Address :" +address);
   }
 }

class empdemo
 {
  public static void main(String arg[])
   {
     emp e=new emp();
     e.getdata("smith",76859,"gulbarga");
     e.putdata();
   }
 }
```

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*OUTPUT\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*
c:\jdk1.6.0_26\bin>javac empdemo.java

c:\jdk1.6.0_26\bin>java empdemo

Employee details are :
Name    :smith
ID       :76859
Address :Gulbarga

## PROGRAM 3

/* Write a Java Program to define a class, define instance methods and overload them and use them for dynamic method invocation.*/

```java
import java.lang.*;

class add
 {
   void display(int a,int b)
    {
      int c=a+b;
      System.out.println("The sum of " + a + " & " + b + " is " + c);
    }

   void display(double a,double b)
    { double c=a+b;
      System.out.println("The sum of " + a + " & " + b + " is " + c);
    }
}

class add_demo
{
 public static void main(String arg[])
  {
    add obj=new add();
    obj.display(10,20);
    obj.display(10.2,20.2);
  }
}
```

***********************************OUTPUT*****************************

c:\jdk1.6.0_26\bin>javac add_demo.java

c:\jdk1.6.0_26\bin>java add_demo

The sum of 10 & 20 is 30
The sum of 10.2 & 20.2 is 30.4

## PROGRAM 4

/* Write a Java Program to demonstrate use of sub class */

```java
import java.lang.*;
class parent
  {
   int m;
   void get_m(int m)
     {
      this.m=m;
     }
   void display_m()
     {
      System.out.println("This is from parent : m = " +m);
     }
  }
class child extends parent
{
   int n;
   void get_n(int n)
     {
      this.n=n;
     }
   void display_n()
     {
      System.out.println("This is from child : n = " +n);
     }
}

class childdemo
{
  public static void main(String arg[])
   {
    child c=new child();
    c.get_m(10);
    c.get_n(20);
    c.display_m();
    c.display_n();
   }
}
```

***************************OUTPUT*****************************

C:\jdk1.6.0_26\bin>javac childdemo.java

C:\jdk1.6.0_26\bin>java childdemo

This is from parent : m = 10
This is from child : n = 20

## PROGRAM 5

/* Write a Java Program to demonstrate use of nested class.*/

```
import java.lang.*;
class outer
 {
   int m=10;
   class inner
    {
       int n=20;
       void display()
      {
       System.out.println("m = "+m);
       System.out.println("n = "+n);
      }
    }
}

class nesteddemo
{
  public static void main(String arg[])
   {
outer outobj=new outer();
  outer.inner inobj=outobj.new inner();
  inobj.display();
    }
}
```

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*OUTPUT\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*


C:\jdk1.6.0_26\bin>javac nesteddemo.java

C:\jdk1.6.0_26\bin>java nesteddemo

m = 10
n = 20

## PROGRAM 6

/* Write a Java Program to implement array of objects. */

```java
import java.lang.*;

public class EmployeeTest
    {
      public static void main(String[] args)
      {
       Employee[] staff = new Employee[3];
       staff[0] = new Employee("Harry Hacker", 3500);
       staff[1] = new Employee("Carl Cracker", 7500);
       staff[2] = new Employee("Tony Tester", 3800);
       for (int i = 0; i < 3; i++)
       staff[i].print();
      }
  }

class Employee
  {
    private String name;
    private double salary;
    public Employee(String n, double s)
      {
        name = n;
        salary = s;
      }
    public void print()
      {
       System.out.println(name + " " + salary);
      }
  }
```

 *****************OUTPUT***************************

C:\jdk1.6.0_26\bin>javac EmployeeTest.java

C:\jdk1.6.0_26\bin>java EmployeeTest

Harry Hacker 3500.0
Carl Cracker 7500.0
Tony Tester 3800.0

## PROGRAM 7 (A)

Write a Java program to practice using String class and its methods.

```java
import java.lang.String;
class stringdemo
{
  public static void main(String arg[])
   {
     String s1=new String("gpt gulbarga");
     String s2="GPT GULBARGA";
     System.out.println(" The string s1 is : " +s1);
     System.out.println(" The string s1 is : " +s2);
     System.out.println(" Length of the string s1 is : " +s1.length());
     System.out.println(" The first accurence of r is at the position : " +s1.indexOf('r'));
     System.out.println(" The String in Upper Case : " +s1.toUpperCase());
     System.out.println(" The String in Lower Case : " +s1.toLowerCase());
     System.out.println(" s1 equals to s2 : " +s1.equals(s2));
     System.out.println(" s1 equals ignore case to s2 : " +s1.equalsIgnoreCase(s2));
     int result=s1.compareTo(s2);
     System.out.println("After compareTo()");
      if(result==0)
      System.out.println( s1 + " is equal to "+s2);
     else if(result>0)
      System.out.println( s1 + " is greather than to "+s2);
      else
      System.out.println( s1 + " is smaller than to "+s2);
     System.out.println(" Character at an index of 6 is :" +s1.charAt(6));
     String s3=s1.substring(4,12);
     System.out.println(" Extracted substring is :"+s3);
     System.out.println(" After Replacing g with a in s1 : " + s1.replace('g','a'));
     String s4="   This is a book   ";
     System.out.println(" The string s4 is :"+s4);
     System.out.println(" After trim()     :"+s4.trim());
   }
}
```

*************************OUTPUT*********************************

c:\jdk1.6.0_26\bin>javac stringdemo.java

c:\jdk1.6.0_26\bin>java stringdemo

 The string s1 is : gpt gulbarga
 The string s1 is : GPT GULBARGA
 Length of the string s1 is : 12
 The first accurence of r is at the position : 9
 The String in Upper Case : GPT GULBARGA

The String in Lower Case : gpt gulbarga
s1 equals to s2 : false
s1 equals ignore case to s2 : true
After compareTo()
gpt gulbarga is greather than to GPT GULBARGA
Character at an index of 6 is :l
Extracted substring is :gulbarga
After Replacing g with a in s1 : apt aulbaraa
The string s4 is :   This is a book
After trim()     :This is a book

## PROGRAM 7 (B)

Write a Java program to practice using String Buffer class and its methods.

```java
import java.lang.String;
class stringbufferdemo
{
  public static void main(String arg[])
   {
    StringBuffer sb=new StringBuffer("This is my college");
    System.out.println("This string sb is : " +sb);
    System.out.println("The length of the string sb is : " +sb.length());
    System.out.println("The capacity of the string sb is : " +sb.capacity());
    System.out.println("The character at an index of 6 is : " +sb.charAt(6));
    sb.setCharAt(3,'x');
    System.out.println("After setting char x at position 3 : " +sb);
    System.out.println("After appending  : " +sb.append(" in gulbarga "));
    System.out.println("After inserting : " +sb.insert(19,"gpt "));
    System.out.println("After deleting  : " +sb.delete(19,22));
   }
}
```

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*OUTPUT\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

c:\jdk1.6.0_26\bin>javac stringbufferdemo.java

c:\jdk1.6.0_26\bin>java stringbufferdemo

This string sb is : This is my college
The length of the string sb is : 18
The capacity of the string sb is : 34
The character at an index of 6 is : s
After setting char x at position 3 : Thix is my college
After appending  : Thix is my college in gulbarga
After inserting : Thix is my college gpt in gulbarga
After deleting  : Thix is my college  in gulbarga

## PROGRAM 8

Write a Java Program to implement Vector class and its methods.

```
import java.lang.*;
import java.util.Vector;
import java.util.Enumeration;
class vectordemo
{
public static void main(String arg[])
  {
    Vector v=new Vector();
    v.addElement("one");
    v.addElement("two");
    v.addElement("three");
    v.insertElementAt("zero",0);
    v.insertElementAt("oops",3);
    v.insertElementAt("four",5);
    System.out.println("Vector Size :"+v.size());
    System.out.println("Vector apacity :"+v.capacity());
    System.out.println(" The elements of a vector are :");
    Enumeration e=v.elements();
    while(e.hasMoreElements())
    System.out.println(e.nextElement() +" ");
    System.out.println();
    System.out.println("The first element is : " +v.firstElement());
    System.out.println("The last element is : " +v.lastElement());
    System.out.println("The object oops is found at position : "+v.indexOf("oops"));
    v.removeElement("oops");
    v.removeElementAt(1);
    System.out.println("After removing 2 elements ");
    System.out.println("Vector Size :"+v.size());
    System.out.println("The elements of vector are :");
    for(int i=0;i<v.size();i++)
    System.out.println(v.elementAt(i)+" ");
  }
}
```

***********************OUTPUT***************************

C:\jdk1.6.0_26\bin>javac vectordemo.java

C:\jdk1.6.0_26\bin>java vectordemo
 Vector Size :6
 Vector apacity :10
 The elements of a vector are :
  zero
  one
  two
  oops

three
four

The first element is : zero
The last element is : four
The object oops is found at position : 3
After removing 2 elements
Vector Size :4
The elements of vector are :
zero
two
three
four

## PROGRAM 9

Write a Java Program to implement Wrapper classes and their methods.

```java
import java.io.*;
class wrapperdemo
  {
    public static void main(String  args[])
     {
      Float P=new Float(0);
      Float I=new Float(0);
      int y=0;
      try
       {
        DataInputStream ds=new DataInputStream(System.in);
        System.out.println("ENTER THE PRINCIPAL AMOUNT");
        System.out.flush();
        String sp=ds.readLine();
        P=Float.valueOf(sp);
        System.out.println("ENTER THE INTEREST RATE");
        System.out.flush();
        String SI=ds.readLine();
        I=Float.valueOf(SI);
        System.out.println("ENTER THE NUMBER OF YEARS");
        System.out.flush();
        String sy=ds.readLine();
        y=Integer.parseInt(sy);
       }
     catch(Exception e)
       {
          System.out.println("INPUT OUTPUT ERROR");
          System.exit(1);
       }
    float value=loan(P.floatValue(),I.floatValue(),y);

    System.out.println("FINAL VALUE IS:"+value);

   }
static float loan(float P,float I,int y)
   {
     int year=1;
     float sum=P;
     while(year<=y)
     {
      sum=sum+(P*I)/100;
      year++;
     }
      return sum;
   }

}
```

******************************OUTPUT***************************

C:\jdk1.6.0_26\bin>javac wrapperdemo.java
Note: wrapperdemo.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

C:\jdk1.6.0_26\bin>java wrapperdemo
ENTER THE PRINCIPAL AMOUNT
1000
ENTER THE INTEREST RATE
2
ENTER THE NUMBER OF YEARS
1
FINAL VALUE IS:1020.0

E:\jdk1.6.0_26\bin>java wrapperdemo
ENTER THE PRINCIPAL AMOUNT
1000
ENTER THE INTEREST RATE
2
ENTER THE NUMBER OF YEARS
2
FINAL VALUE IS:1040.0

## PROGRAM 10

Write a Java Program to implement inheritance and demonstrate use of method overriding.

```
import java.lang.*;
class A
{
  void display()
   {
     System.out.println("This is from class A ");
   }
}
 class B extends A
{
  void display()
   {
     System.out.println("This is from class B ");
   }
}

class AB
{
  public static void main(String arg[])
   {
     B obj=new B();
     obj.display();
   }
}
```

*********************************OUTPUT*****************
C:\jdk1.6.0_26\bin>javac AB.java

C:\jdk1.6.0_26\bin>java AB

This is from class B

## **PROGRAM 11**

/* Write a Java Program to implement multilevel inheritance by applying various access controls to its data members and methods. */

```java
import java.io.DataInputStream;
class Student
 {
   private int rollno;
   private String name;
   DataInputStream dis=new DataInputStream(System.in);
   public void getrollno()
    {
      try
       {
         System.out.println("Enter rollno ");
         rollno=Integer.parseInt(dis.readLine());
         System.out.println("Enter name ");
         name=dis.readLine();

       }
      catch(Exception e){   }
    }
     void putrollno()
      {
        System.out.println("Roll No ="+rollno);
        System.out.println("Name ="+name);
      }
  }

class Marks extends Student
{
   protected int m1,m2,m3;
   void getmarks()
    {
      try
       {
         System.out.println("Enter marks :");
         m1=Integer.parseInt(dis.readLine());
         m2=Integer.parseInt(dis.readLine());
         m3=Integer.parseInt(dis.readLine());
       }
      catch(Exception e) {   }
    }
   void putmarks()
    {
      System.out.println("m1="+m1);
      System.out.println("m2="+m2);
      System.out.println("m3="+m3);
    }
```

```
}

class Result extends Marks
{
  private float total;
  void compute_display()
   {
     total=m1+m2+m3;
     System.out.println("Total marks :" +total);
   }
}
class MultilevelDemo
{
  public static void main(String arg[])
   {
     Result r=new Result();
     r.getrollno();
     r.getmarks();
     r.putrollno();
     r.putmarks();
     r.compute_display();
   }
}
```

*********************OUTPUT***************************

C:\jdk1.6.0_26\bin>javac MultilevelDemo.java
Note: MultilevelDemo.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

C:\jdk1.6.0_26\bin>java MultilevelDemo
Enter rollno
12345
Enter name
Avinash
Enter marks :
54
78
46
Roll No =12345
Name =Avinash
m1=54
m2=78
m3=46
Total marks :178.0

## PROGRAM 12 (A)

Write a program to demonstrate  use of implementing interfaces.

```
import java.lang.*;
interface Area
{
     final static float pi=3.14F;
     float compute(float x,float y);
}
class rectangle implements Area
  {
     public float compute(float x,float y)
       {
          return(pi*x*y);
       }
  }
class circle implements Area
  {
     public float compute(float x,float x)
       {
          return(pi*x*x);
       }
  }
class interfacedemo
{
     public static void main(String a[])
     {
       rectangle rect=new rectangle();
       circle cir=new circle();
       Area A;
       A=rect;
       System.out.println("Area of rectangle="+A.compute(10,20));
       A=cir;
       System.out.println("Area of circle="+A.compute(30,0));
     }
}
```

************************OUTPUT**********************************
C:\jdk1.6.0_26\bin>javac interfacedemo.java

C:\jdk1.6.0_26\bin>java interfacedemo

Area of rectangle=628.0
Area of circle=2,827.43

## PROGRAM 12 (B)

Write a program to demonstrate  use of extending interfaces.

```java
import java.lang.*;
interface Area
{
    final static float pi=3.14F;
    double compute(double x,double y);
}

interface display extends Area
{
    void display_result(double result);

}

class rectangle implements display
{
public double compute(double x,double y)
    {
       return(pi*x*y);
    }
public void display_result(double result)
    {
    System.out.println("The Area is :" +result);
    }
}

class InterfaceExtendsDemo
{
   public static void main(String a[])
   {
    rectangle rect=new rectangle();
    double result=rect.compute(10.2,12.3);
    rect.display_result(result);
   }
}
```

*********************************OUTPUT***********************


C:\jdk1.6.0_26\bin>javac InterfaceExtendsDemo.java

C:\jdk1.6.0_26\bin>java InterfaceExtendsDemo

The Area is : 393.9444131612778

## PROGRAM 13

Write a Java program to implement the concept of importing classes from user defined package and creating packages.

/*Source code of package p1 under the directory C:\jdk1.6.0_26\bin>p1\edit Student.java */

```java
package p1;
public class Student
{
  int regno;
   String name;

  public void getdata(int r,String s)
   {
    regno=r;
    name=s;
   }
   public void putdata()
   {
    System.out.println("regno = " +regno);
    System.out.println("name = " + name);
    }
}
```
/* Source code of the main function under C:\jdk1.6.0_26\bin>edit StudentTest.java */

```java
import p1.*;

class StudentTest
 {
   public static void main(String arg[])
   {
    student s=new student();
     s.getdata(123,"xyz");
      s.putdata();
   }
}
```

***************************OUTPUT****************************

C:\jdk1.6.0_26\bin>javac p1\Student.java

C:\jdk1.6.0_26\bin>javac StudentTest.java

C:\jdk1.6.0_26\bin>java StudentTest
regno = 123
name = xyz

## **PROGRAM 14 (A)**

Write a program to implement the concept of threading by extending Thread Class

```
import java.lang.Thread;

class A extends Thread
    {
        public void run()
        {
            System.out.println("thread A is sterted:");
            for(int i=1;i<=5;i++)
            {
                System.out.println("\t from thread A:i="+i);
            }
            System.out.println("exit from thread A:");
        }
    }

class B extends Thread
    {
        public void run()
        {
            System.out.println("thread B is sterted:");
            for(int j=1;j<=5;j++)
            {
                System.out.println("\t from thread B:j="+j);
            }
            System.out.println("exit from thread B:");
        }
    }

class C extends Thread
    {
        public void run()
        {
            System.out.println("thread C is sterted:");
            for(int k=1;k<=5;k++)
            {
                System.out.println("\t from thread C:k="+k);
            }
            System.out.println("exit from thread C:");
        }
    }
class Threadtest
    {
        public static void main(String arg[])
        {
            new A().start();
            new B().start();
```

```
        new C().start();

    }
  }
```

\***\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***OUTPUT\***\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

```
thread A is sterted:
thread B is sterted:
thread C is sterted:
        from thread A:i=1
        from thread B:j=1
        from thread C:k=1
        from thread A:i=2
        from thread B:j=2
        from thread C:k=2
        from thread A:i=3
        from thread B:j=3
        from thread C:k=3
        from thread A:i=4
        from thread B:j=4
        from thread C:k=4
        from thread A:i=5
        from thread B:j=5
        from thread C:k=5
exit from thread A:
exit from thread B:
exit from thread C:
```

### PROGRAM 14 (B)

Write a program to implement the concept of threading by implementing Runnable Interface

```java
import java.lang.Runnable;

class X implements Runnable
  {
    public void run()
      {
         for(int i=1;i<10;i++)
           {
               System.out.println("\t Thread X:"+i);
           }
         System.out.println("End of Thread X");
      }
  }

class Runnabletest
  {
    public static void main(String arg[])
     {
        X R=new X();
        Thread T=new Thread(R);
         T.start();
      }
  }
```

******************************OUTPUT********************************

```
    Thread X:1
    Thread X:2
    Thread X:3
    Thread X:4
    Thread X:5
    Thread X:6
    Thread X:7
    Thread X:8
    Thread X:9
    End of Thread X
```

## PROGRAM 15 (A)

Write a program to implement the concept of Exception Handling using predefined exception.

```
import java.lang.*;

class Exception_handle
  {
     public static void main(String argv[])
       {
          int a=10,b=5,c=5,x,y;
          try
           {
              x=a/(b-c);
           }
           catch(ArithmeticException e)
             {
                System.out.println("DIVISION BY ZERO");
             }
          y=a/(b+c);
          System.out.println("y="+y);
       }
   }
```

*******************************OUTPUT*********************************

DIVISION BY ZERO
y=1

### PROGRAM 15 (B)

Write a program to implement the concept of Exception Handling by creating user defined exceptions.

```
import java.lang.Exception;
import java.lang.*;
import java.lang.Exception;
import java.io.DataInputStream;

class MyException extends Exception
   {
      MyException(String message)
        {
            super(message);
        }
   }

class userdef
   {
      public static void main(String a[])
         {
            int age;
            DataInputStream ds=new DataInputStream(System.in);
                try
              {
            System.out.println("Enter the age (above 15 abd below 25)  :");
            age=Integer.parseInt(ds.readLine());
            if(age<15 || age> 25)
               {
                  throw new MyException("Number not in range");
               }
             System.out.println(" the number is :" +age);
           }

         catch(MyException e)
          {
              System.out.println("Caught MyException");
              System.out.println(e.getMessage());
          }
         catch(Exception e){ System.out.println(e); }

      }
   }
```

****************************OUTPUT 1****************************

c:\jdk1.6.0_26\bin>java userdef

Enter the age (above 15 abd below 25)  :
6
Caught MyException
Number not in range

****************************OUTPUT 2****************************

c:\jdk1.6.0_26\bin>java userdef

Enter the age (above 15 abd below 25)  :
20
 the number is :20

## **PROGRAM 16 (A)**

Write a program using Applet to display a message in the Applet.

```
import java.applet.*;
import java.awt.Graphics;

/* <applet code="Appletdemo.class" width=300 height=300> </applet> */

public class Appletdemo extends Applet
{
  public void paint(Graphics g)
  {
   String msg="HELLO!, Welcome to my applet ";
   g.drawString(msg,80,150);
  }
}
```

*****************************OUTPUT************************

C:\jdk1.6.0_26\bin>javac Appletdemo.java

C:\jdk1.6.0_26\bin>appletviewer Appletdemo.java

## PROGRAM 16 (B)

/*Write a program using Applet For configuring Applets by passing parameters.*/

```
import java.applet.*;
import java.awt.Graphics;

/* <applet code="AppletParamDemo.class" width=300 height=100>
<param name=place value="Gulbarga"> <param name=college  value="Govt Polytechnic">
</applet> */

public class AppletParamDemo extends Applet
{
  String p,c;
  public void init()
   {
      p=getParameter("place");
      c=getParameter("college");
   }
  public void paint(Graphics g)
   {
      g.drawString(c,80,20);
      g.drawString(p,100,40);
   }
}
```

*****************************OUTPUT*****************************
C:\jdk1.6.0_26\bin>javac AppletParamDemo.java

C:\jdk1.6.0_26\bin>appletviewer AppletParamDemo.java
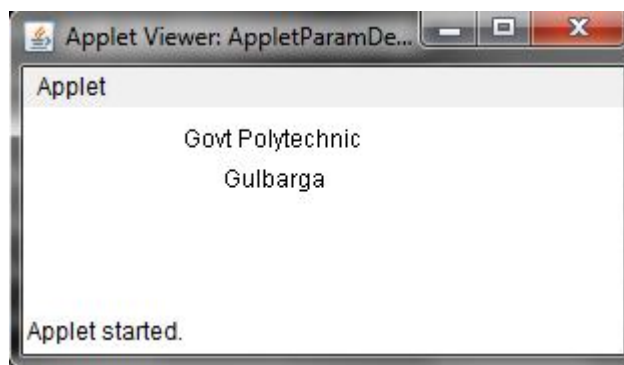
## PROGRAM 17 (A)

Write a Java Program to demonstrate Keyboard event

```java
import java.applet.*;
import java.awt.event.*;
import java.awt.*;

/* <applet code="KeyEvents.class" width=300 height=200> </applet> */

public class KeyEvents extends Applet implements KeyListener
{
 String msg =" ";
 int x=10,y=20;
 public void init()
  {
   addKeyListener(this);
   requestFocus();
  }

public void keyPressed(KeyEvent k)
  {
     showStatus("key down");
  }

public void keyReleased(KeyEvent k)
  {
     showStatus("key up");
  }
public void keyTyped(KeyEvent k)
  {
    msg +=k.getKeyChar();
    repaint();
  }
 public void paint(Graphics g)
  {
    g.drawString(msg,x,y);
  }
}
```

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*OUTPUT\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

C:\jdk1.6.0_26\bin>javac Keyevents.java

C:\jdk1.6.0_26\bin>appletviewer Keyevents.java
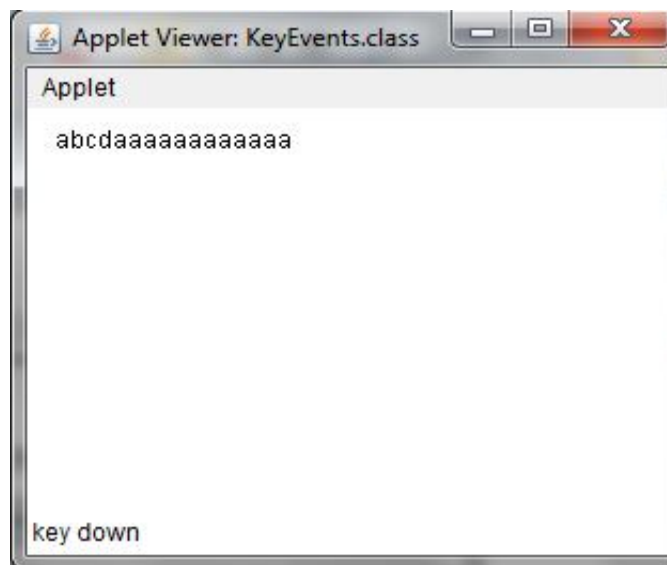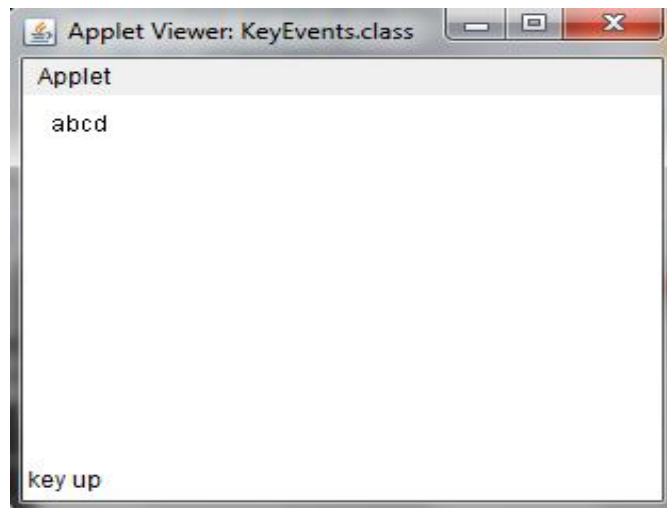
## PROGRAM 17 (B)

Write a Java Program to demonstrate Mouse events

```
import java.applet.*;
import java.awt.event.*;
import java.awt.*;

/* <applet code="MouseEvents.class" width=300 height=200> </applet> */

public class MouseEvents extends Applet implements MouseListener,MouseMotionListener
{
   String msg =" ";
   int x=0,y=0;
 public void init()
  {
    addMouseListener(this);
    addMouseMotionListener(this);
  }

public void mouseClicked(MouseEvent m)
  {
   x=10;
   y=10;
   msg ="mouse clicked";
   repaint();
  }

public void mouseEntered(MouseEvent m)
  {
   x=10;
   y=10;
   msg ="mouse Entered";
   repaint();
  }

public void mouseExited(MouseEvent m)
  {
   x=10;
   y=10;
   msg ="mouse Exited";
   repaint();
  }

public void mousePressed(MouseEvent m)
  {
   x=m.getX();
   y=m.getY();
   msg ="Down";
   repaint();
```
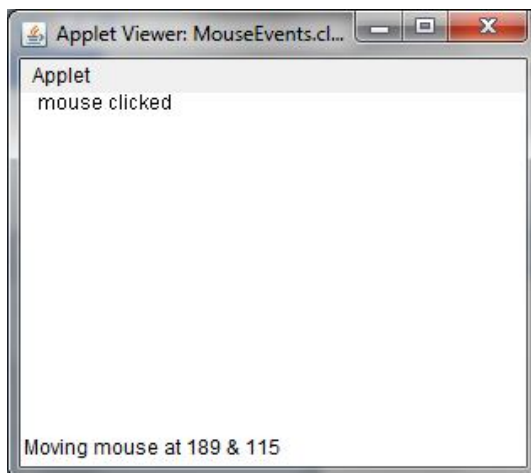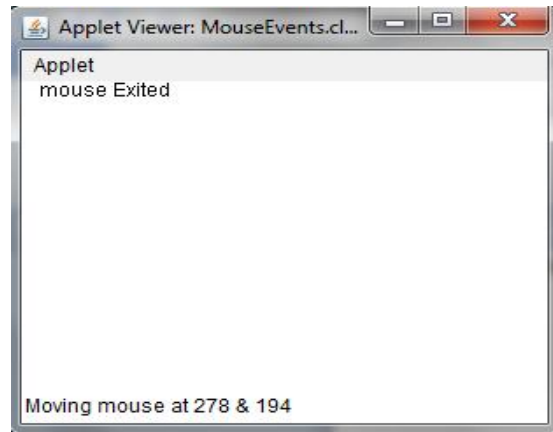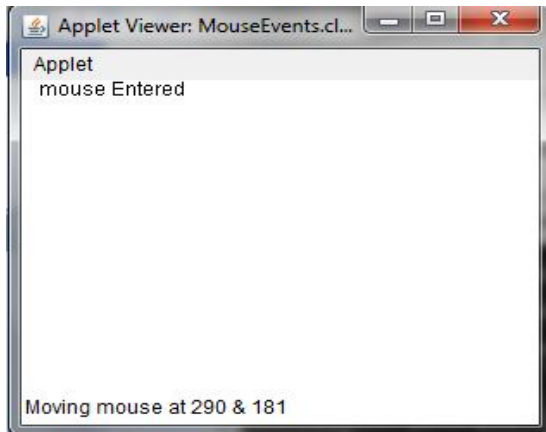
```java
    }
public void mouseReleased(MouseEvent m)
  {
  x=m.getX();
  y=m.getY();
  msg ="Up";
  repaint();
  }

public void mouseDragged(MouseEvent m)
  {
  x=m.getX();
  y=m.getY();
  msg ="*";
  showStatus("Draggeg mouse at " +x+ " & "+y);
  repaint();
  }
public void mouseMoved(MouseEvent m)
  {
  showStatus("Moving mouse at " +m.getX()+ " & "+m.getY());
  }
public void paint(Graphics g)
  {
   g.drawString(msg,x,y);
  }
}
```

**OUTPUT**
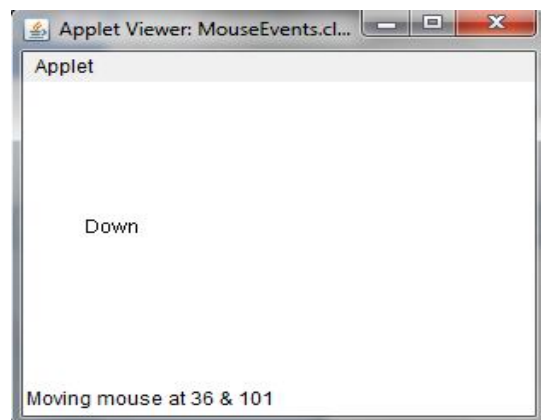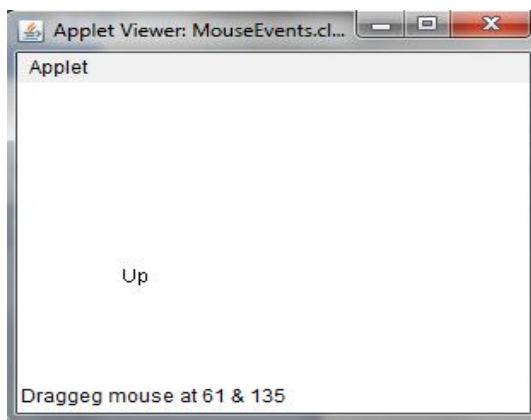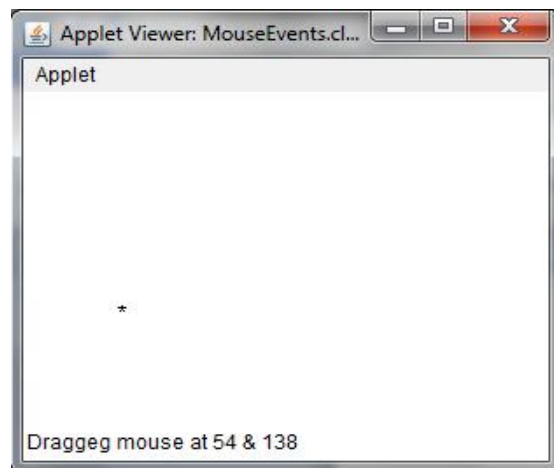
## PROGRAM 18

Write programs for using Graphics class

   - to display basic shapes and fill them

   - draw different items using basic shapes

   - set background and foreground colors.

```
import java.applet.*;
import java.awt.*;

/* <applet code="Shapes.class" width=800 height-800> </applet>*/

public class Shapes extends Applet
  {
    public void paint(Graphics g)
      {
       setForefround(Color.red);
       setBackGround(Color.blue);
       //drawing squares
       g.drawLine(10,10,100,10);
       g.drawLine(10,10,10,10);
       g.drawLine(10,100,100,100);
       g.drawLine(100,100,100,10);
       // Drawing triangle
       g.drawLine(10,120,100,120);
       g.drawLine(10,120,50,200);
       g.drawLine(50,200,100,120);
       //drawing Rectangle
       g.drawRect(120,10,220,120);
       g.fillRect(120,120,220,120);
       //drawing ellipse and circle
       g.drawOval(10,220,100,220);
       g.setColor(Cplor.yellow);
       g.fillOval(120,250,250,250);
       //draw a filled arc
       g.fillArc(350,50,400,100,0,90);
       //draw a polygon
       int x[]={400,500,400,500};
       int y[]={240,240,340,340};
       g.drawPolygon(x,y,4);
       }
}
```

**OUTPUT**