Assignment 1

/* Write a java program to demonstrate all the basic programming features such as if else condition, switch case, loops, break and continue statements, variables data type and operators. */

```
import java.util.Scanner;
class Demo
{
	public static void main(String args[])
	{

		int rno, total, m1, m2, m3, day;
		float per;
		Scanner in=new Scanner(System.in);
		System.out.println("Enter the name: ");
		char name=in.next().charAt(0);
		System.out.println(name);

		Scanner s = new Scanner(System.in);
		System.out.println("\n\nEnter the marks of 3 subjects: ");
		m1 = s.nextInt();
	m2 = s.nextInt();
	m3 = s.nextInt();

		total= m1+m2+m3;
		per= (float)total/3 ;
		System.out.println("\n\n Percentage =" +per);

		if(per < 50)
		{
			System.out.println("\n\nStudent is failed!");
		}
		else
		{
			System.out.println("\n\nStudent is passed!");
		}
```

/* Write a java program to demonstrate all the basic programming features such as if else condition, switch case, loops, break and continue statements, variables data type and operators. */

```
Scanner scan = new Scanner(System.in);
System.out.println("\n\n Enter a Day number between 1 to 7 : ");
day = scan.nextInt();


    switch (day)
    {
        case 1:
            System.out.println("Monday");
            break;
        case 2:
            System.out.println("Tuesday");
            break;
        case 3:
            System.out.println("Wednesday");
            break;
        case 4:
            System.out.println("Thursday");
            break;
        case 5:
            System.out.println("Friday");
            break;
        case 6:
            System.out.println("Saturday");
            break;
        case 7:
            System.out.println("Sunday");
            break;
    }

    System.out.println("\n\n Demo of continue");
    for (int j=0; j<=6; j++)
```

/* Write a java program to demonstrate all the basic programming features such as if else condition, switch case, loops, break and continue statements, variables data type and operators. */

```
	{
		if (j==4)
		{
				continue;
			}
		System.out.print(j+" ");
		}
	}
}
```

Output:

```
E:\Java>javac Demo.java

E:\Java>java Demo
Enter the name:
Sanket
S


Enter the marks of 3 subjects:
89
87
88


 Percentage =88.0


Student is passed!


 Enter a Day number between 1 to 7 :
5
Friday


 Demo of continue
0 1 2 3 5 6
```

Assignment 2

/*Write a program in java to create Fibonacci series. */

```
class Fibo
{
	public static void main(String args[])
	{
		int pno=0, cno=1, add, i, count=10;
		System.out.print(pno+" "+cno);//printing 0 and 1

		for(i=2;i<count;++i)//loop starts from 2 because 0 and 1 are already
printed
		{
			add= pno + cno;
			System.out.print(" "+add);
			pno= cno;
			cno= add;
		}

	}
}
```

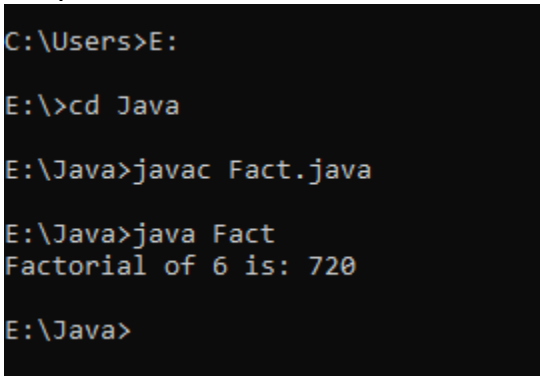
Output:

```
C:\Users\Sanket>cd..

C:\Users>E:

E:\>cd Java

E:\Java>javac Fibo.java

E:\Java>java Fibo
0 1 1 2 3 5 8 13 21 34
E:\Java>
```

/*Write a program in java to create Factorial of a number. */

```
class Fact
{
	public static void main(String args[])
	{
		int i,fact=1, no=6;
		for(i=1;i<=no;i++)
		{
			fact=fact*i;
		}
		System.out.println("Factorial of "+no+" is: "+fact);
	}
}
```

Output:



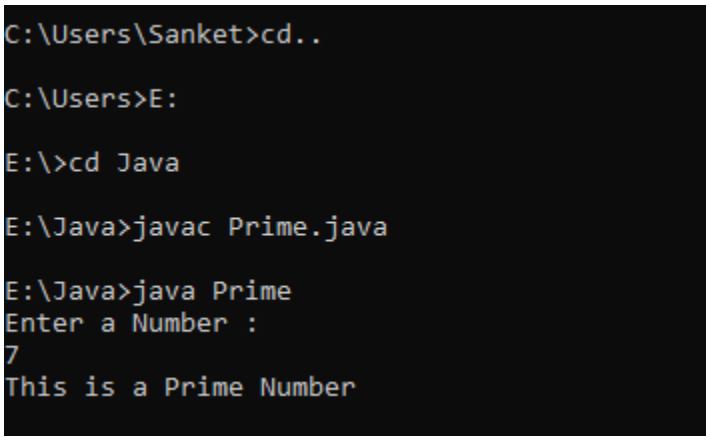
/*Write a program in java to create Prime number. */

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

```
class Prime
{
	public static void main(String args[])
	{
	int num, i, count= 0;
	Scanner scan = new Scanner(System.in);
	System.out.println("Enter a Number : ");
	num = scan.nextInt();
	for(i = 2; i < num; i++)
	{
		if(num % i == 0)
		{
			count++;
			break;
			}
	}
	if(count == 0)
	{
			System.out.println("This is a Prime Number");
	}
	else
	{
			System.out.println("This is not a Prime Number");
	}
	}
}
```

/*Write a program in java to create Prime number. */

Output:



/*Write a program in java to create Armstrong number. */

```
import java.util.Scanner;
class Arms
{
```

```
	public static void main(String args[])
	{
		int res=0, a, no, temp;
		Scanner scan = new Scanner(System.in);
	System.out.println("Enter a Number : ");
	no= scan.nextInt();
		temp=no;
		while(no>0)
		{
			a=no%10;
			no=no/10;
			res=res+(a*a*a);
		}
		if(temp==res)
			System.out.println(" It is an armstrong number");
		else
		System.out.println("It is not an armstrong number");
	}
}
```

/*Write a program in java to create Armstrong number. */

Output:

```
E:\>cd Java

E:\Java>javac Arms.java

E:\Java>java Arms
Enter a Number :
371
 It is an armstrong number
```

/*Write a program in java to create Reverse number. */

```
import java.util.Scanner;
class Reverse
{
	public static void main(String args[])
```

```
	{
		int no, rev=0;
		System.out.println("Enter an integer to get it reverse");
		Scanner scan = new Scanner(System.in);
		no = scan.nextInt();
		while(no != 0)
		{
		rev = rev * 10;
		rev = rev + no % 10;
		no = no / 10;
		}
		System.out.println("Reverse of the number is " + rev);
	}
}
```

Output:

```
C:\Users\Sanket>cd..

C:\Users>E:

E:\>cd Java

E:\Java>javac Reverse.java

E:\Java>java Reverse
Enter an integer to get it reverse
12345
Reverse of the number is 54321
```

/*Write a program in java to create Palindrome number. */

```
import java.util.Scanner;
class Palin
{
	public static void main(String args[])
	{
```

```
        int rem, sum=0, temp, no;
        Scanner scan = new Scanner(System.in);
    System.out.println("Enter a Number : ");
    no= scan.nextInt();
        temp=no;
        while(no>0)
        {
            rem=no%10;
            sum=(sum*10)+rem;
            no=no/10;
        }
        if(temp==sum)
            System.out.println("It is a palindrome number ");
        else
            System.out.println("It is not a palindrome number");
    }
}
```

Ouput:

```
C:\Users\Sanket>cd..

C:\Users>E:

E:\>cd Java

E:\Java>javac Palin.java

E:\Java>java Palin
Enter a Number :
12321
It is a palindrome number
```

Assignment 3

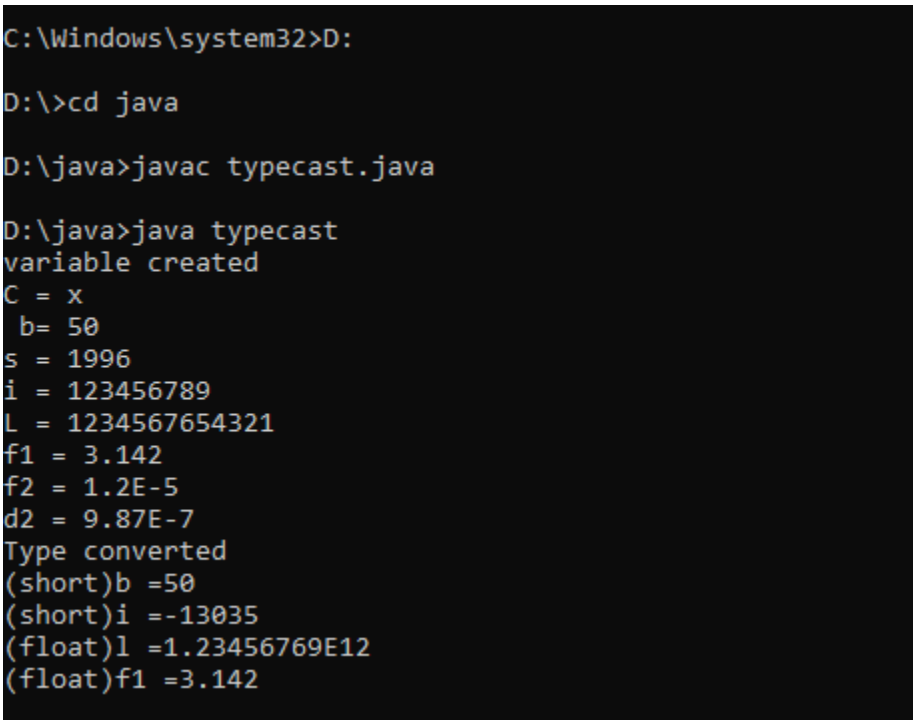
/*Write a program in java to demonstrate typecasting concept on various primitive data type.*/

```
class typecast
{
	public static void main(String args[])
	{
		System.out.println("variable created");
		char c='x';
		byte b=50;
		short s=1996;
		inti =123456789;
		long L=1234567654321L;
		float f1=3.142F;
		float f2=1.2e-5f;
		double d2=0.000000987;

		System.out.println("C = "+c);
		System.out.println(" b= "+b);
		System.out.println("s = "+s);
		System.out.println("i = "+i);
		System.out.println("L = "+L);
		System.out.println("f1 = "+f1);
		System.out.println("f2 = "+f2);
		System.out.println("d2 = "+d2);

		System.out.println("Type converted");
		short s1=(short)b;
		short s2=(short)i;
		float n1=(float)L;
		float m1=(float)f1;
		System.out.println("(short)b ="+s1);
		System.out.println("(short)i ="+s2);
		System.out.println("(float)l ="+n1);
		System.out.println("(float)f1 ="+m1);
```

```
        }
}
```

/*Write a program in java to demonstrate typecasting concept on various primitive data type.*/

Output:



Assignment 4

/*Write a java program to demonstrate the use of wrapper classes and its methods (3 methods).*/

```
import java.io.*;
class Invest
{
	public static void main(String args[])
	{
		Float PrincipalAmount=new Float(0);
		Float InterestRate=new Float(0);
		intnumYears=0;
		try
		{
			DataInputStream in=new DataInputStream(System.in);
			System.out.println("Enter Principal Amount:");
			System.out.flush();
			String principalString=in.readLine();
			PrincipalAmount=Float.valueOf(principalString); //String object
to number object

			System.out.println("Enter interest rate:");
			System.out.flush();
			String interestString=in.readLine();
			InterestRate=Float.valueOf(interestString);

			System.out.println("Enter number of years:");
			System.out.flush();
			String yearString=in.readLine();

			numYears=Integer.parseInt(yearString); //numeric strings to
numbers
		}
```

```
            catch(IOException e)
            {
                  System.out.println("I/O Error");
                  System.exit(1);
```

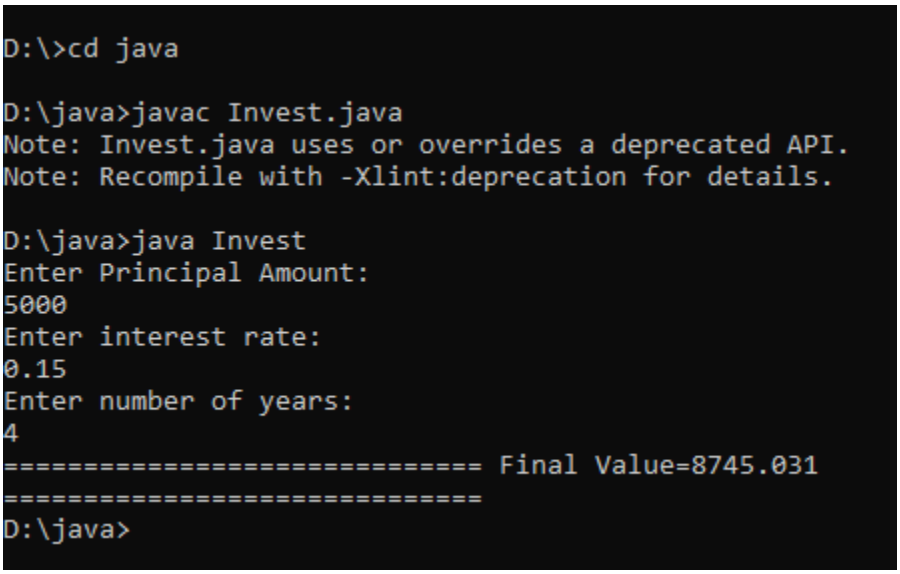
/*Write a java program to demonstrate the use of wrapper classes and its methods (3 methods).*/

```
                  Float
value=loan(PrincipalAmount.floatValue(),InterestRate.floatValue(),numYears);
            printline();
            System.out.println("Final Value=" +value);
            printline();

            }

            //Method to compute final value
            static float loan(float p, float r, int n)
            {
                  int year=1;
                  float sum=p;

                  while(year<=n)
                  {
                        sum=sum*(1+r);
                        year=year+1;
                  }
                  return sum;

            }

            //Method to draw a line
            static void printline()
            {
                  for(inti=1;i<=30;i++)
                  {
                  System.out.print("=");
                  }
```

```
            System.out.print(" ");
            }
    }
```

/*Write a java program to demonstrate the use of wrapper classes and its methods (3 methods).*/

Output:



Assignment 5

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/*Write a java program to accept 1 to 10 numbers and print their sum using command line arguments.*/

```
public class Sumofno
{
	public static void main(String []args)
	{
		int sum=0;
		for(inti=0;i<args.length;i++)
		{
			sum+=Integer.parseInt(args[i]);
		}
		System.out.println("The sum is:"+ sum);
	}
}
```

Output:

```
D:\java>javac Sumofno.java

D:\java>java Sumofno 1 2 3 4 5 6 7 8 9 10
The sum is:55

D:\java>
```

Assignment 6

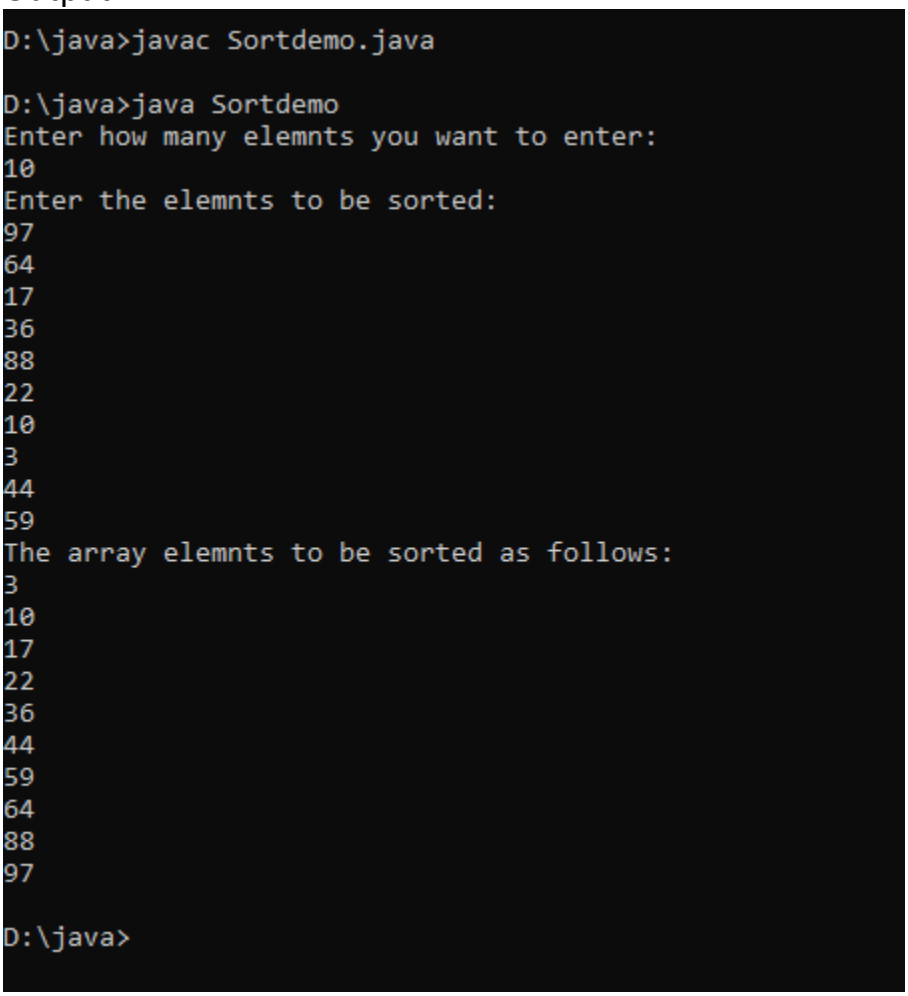
/*Write a java program for accepting 10 integer numbers and sort them in ascending order using bubble sort.*/

```
importjava.lang.*;
importjava.util.Scanner;
public class Sortdemo
{
	public static void main(String args[])
	{
		Scanner sc=new Scanner(System.in);
		intlim;
		System.out.println("Enter how many elemnts you want to enter:");
		lim=sc.nextInt();
		int list[]=new int[lim];
		System.out.println("Enter the elemnts to be sorted:");
		for(inti=0;i<list.length;i++)
		{
			list[i]=sc.nextInt();
		}
		for(inti=0;i<list.length;i++)
		{
			for(int j=i+1;j<list.length;j++)
			{
				if(list[i] > list[j])
				{
					int t=list[i];
					list[i]=list[j];
					list[j]=t;
				}
			}
		}
		System.out.println("The array elemnts to be sorted as follows:");
		for(inti=0;i<list.length;i++)
		{
```

/*Write a java program for accepting 10 integer numbers and sort them in ascending order using bubble sort.*/

```
                System.out.println(list[i]);
            }
        }
}
```

Output:



Assignment 7

/* Write a java program to demonstrate 2D array by finding Addition of Two 3*3 Matrices */

```
importjava.util.Scanner;
public class AddMatrix
{
	public static void main(String args[])
	{
		inti, j;
		int m1[][] = new int[3][3];
		int m2[][] = new int[3][3];
		int m3[][] = new int[3][3];
		Scanner s = new Scanner(System.in);
		System.out.print("Enter Matrix 1 Elements : ");
		for(i=0; i<3; i++)
		{
			for(j=0; j<3; j++)
			{
				m1[i][j] = s.nextInt();
			}
		}
		System.out.print("Enter Matrix 2 Elements : ");
		for(i=0; i<3; i++)
		{
			for(j=0; j<3; j++)
			{
				m2[i][j] = s.nextInt();
			}
		}
		for(i=0; i<3; i++)
		{
			for(j=0; j<3; j++)
			{
				m3[i][j] = m1[i][j] + m2[i][j];
```

/* Write a java program to demonstrate 2D array by finding Addition of Two 3*3 Matrices */

```
                }
            }
            System.out.print("Addition of given 2 matrices:\n");
            for(i=0; i<3; i++)
            {
                for(j=0; j<3; j++)
                {
                    System.out.print(m3[i][j]+ " ");
                }
                System.out.println();
            }
        }
}
```

Output:

```
D:\java>javac AddMatrix.java

D:\java>java AddMatrix
Enter Matrix 1 Elements :
1 2 1
2 0 1
1 1 2
Enter Matrix 2 Elements :
0 1 2
2 1 1
1 2 0
Addition of given 2 matrices:
1 3 3
4 1 2
2 3 2

D:\java>
```

Assignment 8

/* Write a java program to demonstrate 2D array by finding Multiplication of Two 3*3 Matrices */

```
importjava.util.Scanner;
public class MulMatrix
{
	public static void main(String args[])
	{
		inti, j;
		int m1[][] = new int[3][3];
		int m2[][] = new int[3][3];
		int m3[][] = new int[3][3];
		Scanner s = new Scanner(System.in);
		System.out.print("Enter Matrix 1 Elements : ");
		for(i=0; i<3; i++)
		{
			for(j=0; j<3; j++)
			{
				m1[i][j] = s.nextInt();
			}
		}
		System.out.print("Enter Matrix 2 Elements : ");
		for(i=0; i<3; i++)
		{
			for(j=0; j<3; j++)
			{
				m2[i][j] = s.nextInt();
			}

		}
		for(i=0; i<3; i++)
		{
			for(j=0; j<3; j++)
			{
```

/* Write a java program to demonstrate 2D array by finding Multiplication of Two 3*3 Matrices */

```
                        m3[i][j]=0;
                        for(int k=0;k<3;k++)
                        {
                                m3[i][j]+=m1[i][k]*m2[k][j];
                        }
                }
        }
        System.out.print("Multiplication of given 2 matrices:\n");
        for(i=0; i<3; i++)
        {
                for(j=0; j<3; j++)
                {
                        System.out.print(m3[i][j]+ " ");
                }
                System.out.println();
        }
    }
}
```

Output:

```
D:\java>javac MulMatrix.java

D:\java>java MulMatrix
Enter Matrix 1 Elements :
1 1 2
3 2 0
2 1 2
Enter Matrix 2 Elements :
1 0 1
2 1 3
1 1 2
Multiplication of given 2 matrices:
5 3 8
7 2 9
6 3 9
```

Assignment 9

/*Write a program in java to demonstrate the various methods of string class and their use with example.*/

```
public class Demostr
{
	public static void main(String args[])
	{
		String s="computer";
		String s1="computer";
		String s2=new String("Sanket");
		String s3="Shriram";

		if(s.equals(s1)) //comparison with eqauls method
			System.out.println("Strings are equal");
		else
			System.out.println("Strings are not equal");

		if(s1==s2) //comparison with == operator
			System.out.println("Strings are equal");
		else
			System.out.println("Strings are not equal");

		//charAt() method
		System.out.println("The character of first position " +s.charAt(5));
		System.out.println("The character of first position " +s.charAt(3));

		//append two strings using concat() function
		System.out.println("Append one string with another= "+s2.concat(" Mishrikotkar"));
		System.out.println("String append with s1= "+s1+ "None");

		//equalsIgnoreCase() method
		System.out.println(s3.equalsIgnoreCase(("Shriram")));
```

/*Write a program in java to demonstrate the various methods of string class and their use with example.*/

```
            //length() method
            System.out.println(s3.length());

            //toUpperCase() method
            System.out.println(s3.toUpperCase());

            //toLowerCase() method
            System.out.println(s3.toLowerCase());

            //trim() method
            System.out.println(s3.trim());

            //Substring() method
            System.out.println(s3.substring(3));
            System.out.println(s3.substring(5,7));
      }
}
```

Output:

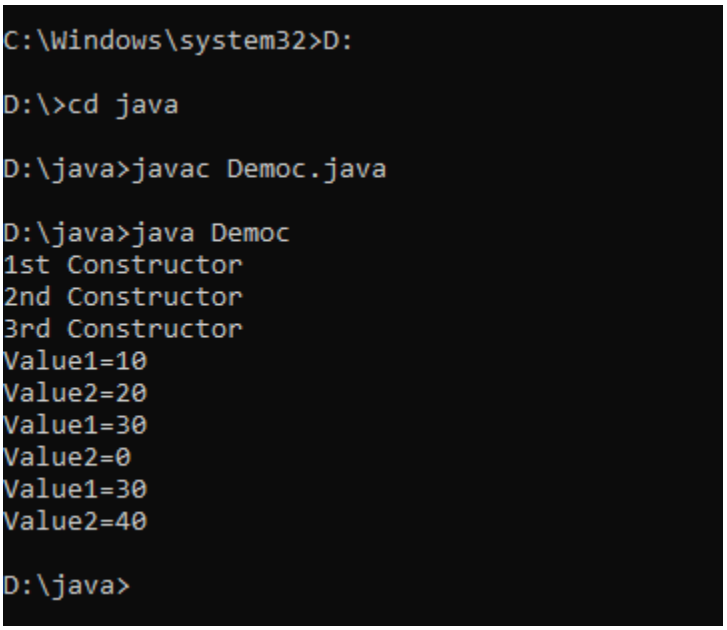
```
D:\java>javac Demostr.java

D:\java>java Demostr
Strings are equal
Strings are not equal
The character of first position t
The character of first position p
Append one string with another= Sanket Mishrikotkar
String append with s1= computerNone
true
7
SHRIRAM
shriram
Shriram
iram
am
```

Assignment 10

```
/* Write a java program to demonstrate various constructors in a single program
*/

classDemoc
{
	int  value1;
int  value2;
	Democ()
	{
		value1 = 10;
		value2 = 20;
		System.out.println("1st Constructor");
	}
	Democ(int a)
	{
		value1 = a;
		System.out.println("2nd Constructor");
	}
	Democ(inta,int b)
	{
		value1 = a;
		value2 = b;
		System.out.println("3rd Constructor");
	}
	public void display()
	{
		System.out.println("Value1="+value1);
		System.out.println("Value2="+value2);
	}
	public static void main(String args[])
	{
		Democ d1 = new Democ();
		Democ d2 = new Democ(30);
		Democ d3 = new Democ(30,40);
/* Write a java program to demonstrate various constructors in a single program
*/
```

```
            d1.display();
            d2.display();
            d3.display();
        }
}
```

Output:

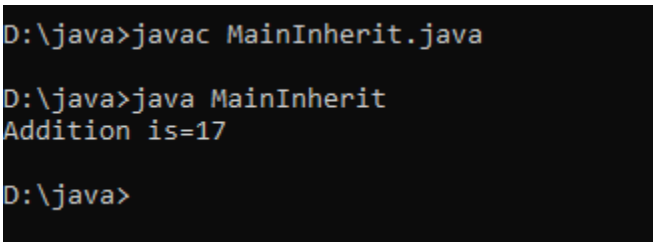


Assignment 11

/*Write a program in java to demonstrate single inheritance*/

```
classSingleInherit
{
        staticint a=10;
        staticint b=5;
}
classMainInherit extends SingleInherit
{
        public static void main(String[] args){
        int c=2;
        int res=a+b+c;
        System.out.println("Addition is="+res);
        }
}
```

Output:

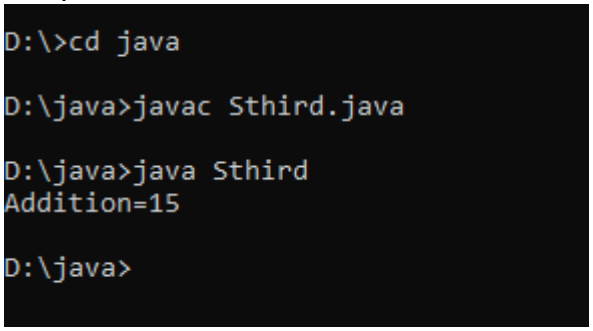


Assignment 12

/* Write a java program to demonstrate multilevel inheritance.*/

```
classSfirst
{
        public static inta,b;
        public void Value()
        {
                a=5; b=10;
        }
}
classSsecond extends Sfirst
{
        public static int c;
        public void Add() { c=a+b; }
}
classSthird extends Ssecond
{
        public static void main(String args[])
        {
                Ssecondss=new Ssecond();
                ss.Value();
                ss.Add();
                System.out.println("Addition=" +c);
        }
}
```

Output:



Assignment 13

/* Write a java program to demonstrate Multiple Inheritance achieved using Interface*/

```
importjava.util.Scanner;
interface Shape
{
void input();
void area();
}
class Circle implements Shape
{
int r;
double pi = 3.14, ar;
   Scanner s = new Scanner(System.in);
public void input()
   {
System.out.print("Enter radius of circle : ");
       r=s.nextInt();
   }
public void area()
   {
ar = pi * r * r;
System.out.println("Area of circle:"+ar);
   }
}
class Rectangle extends Circle
{
int l, b;
doublear;
public void input()
   {
super.input();
                System.out.print("Enter length & breadth of rectangle : ");
                l=s.nextInt();
                b=s.nextInt();
```

```
   }
  /* Write a java program to demonstrate Multiple Inheritance achieved using
Interface*/

public void area()
   {
super.area();
ar = l * b;
System.out.println("Area of rectangle:"+ar);
   }
}
public class InterfaceDemoo
{
public static void main(String[] args)
   {
      Rectangle obj = new Rectangle();
obj.input();
obj.area();
   }
}
```

Output:

```
D:\java>javac InterfaceDemoo.java

D:\java>java InterfaceDemoo
Enter radius of circle : 5
Enter length & breadth of rectangle : 10 20
Area of circle:78.5
Area of rectangle:200.0

D:\java>
```

Assignment 14

/* Write a java program to explain Static & Non-static Inner Classes */

//Static Inner Class:

```
class Outer
{
private double i = 10.5;
private static double k= 11.2;
private static String str = "hello";
static class Inner
    {
int j=5;
public void display()
            {
                //System.out.println("i = " +i); Illegal statement
System.out.println("j = " +j);
System.out.println("k = " +k);
System.out.println("str = "+str);
            }
    }
}
public class StaticClass
{
public static void main(String args[])
     {
Outer.Innerinnobj = new Outer.Inner();
innobj.display();
     }
}
```

Output:

```
D:\java>javac StaticClass.java

D:\java>java StaticClass
j = 5
k = 11.2
str = hello

D:\java>
```

/* Write a java program to explain Static & Non-static Inner Classes */

//Non-Static Inner Class:

```
class Outer
{
int id=11;
        String name="Sanket";
        class Inner
        {
        void show()
              {
        System.out.println("ID="+id);
                        System.out.println("Name="+name);
              }
        }
}
public class NonStatic
{
public static void main(String[] args)
 {
          Outer out=new Outer();
        Outer.Innerobj=out.newInner();
        obj.show();
}
}
```

Output:

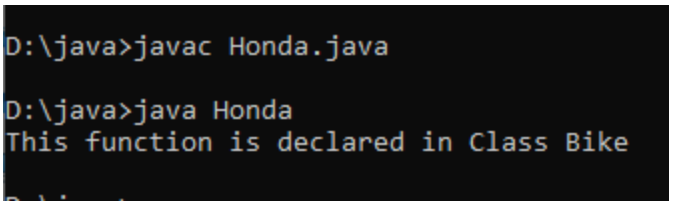
```
D:\java>java NonStatic
ID=11
Name=Sanket
```

Assignment 15

/* Write a java program to demonstrate abstract class & abstract abstract methods */

```
abstract class Bike
{
	abstract void run();
}
class Honda extends Bike
{
	void run()
	{
		System.out.println("This function is declared in Class Bike");
	}
	public static void main(String args[])
	{
		Bike obj = new Honda();
		obj.run();
	}
}
```

Output:


D:\java>javac Honda.java
D:\java>java Honda
This function is declared in Class Bike

Assignment 16

/*Write a Java Program for creating user defined packages(atleast 2 packages)and access the classes of these packages in another program */

Class1.java

```
package  package_one;
public class Class1
{
public void methodClass1()
        {
System.out.println("Class1 method called! ");
        }
}
```

Class2.java

```
package  package_two;
public class Class2
{
public void methodClass2()
         {
System.out.println("Class2 method called! ");
          }
}
```

/*Write a Java Program for creating user defined packages(atleast 2 packages)and access the classes of these packages in another program */

PackageDemo.java

```
importpackage_one.*;
importpackage_two.*;
public class PackageDemo
{
public static void main(String args[])
        {
                Class2 A = new Class2();
                Class1 B = new Class1();
A.methodClass2();
B.methodClass1();
        }
}
```

Output:

```
F:\Practical\cj>javac PackageDemo.java
F:\Practical\cj>java PackageDemo
Class2 method called!
Class1 method called!
```

Assignment 17

/* Write a Simple Java program to demonstrate use of Threads by
a) Implementing Runnable Interface:
b) By extending Thread class: */

```
//a) Implementing Runnable Interface:
class A implements Runnable
{
	public void run()
	{
		System.out.println("");
		for(inti=0;i<=5;i++)
		{
			System.out.println("\t From Thread A, i = "+ i);
		}
		System.out.println("\n\t Exit from A");
	}}
class B implements Runnable
{
	public void run()
	{
		System.out.println("");
		for(int j=0;j<=5;j++)
		{
			System.out.println("\t From Thread B, j = "+ j);
		}
		System.out.println("\n\t Exit from B");
	}}
class C implements Runnable
{
	public void run()
```

```
	{
		System.out.println("");
		for(int k=0;k<=5;k++)
		{
			System.out.println("\t From Thread C, k = "+ k);
//a) Implementing Runnable Interface:

		}
		System.out.println("\n\t Exit from C");
	}}
classThreadTest
{
	public static void main(String args[])
	{
		Thread t1 = new Thread(new A());
		Thread t2 = new Thread(new B());
		Thread t3 = new Thread(new C());
		t1.start();
		t2.start();
		t3.start();
	}}
```

Output:

```
D:\java>javac ThreadTest.java

D:\java>java ThreadTest



        From Thread A, i = 0
        From Thread C, k = 0
        From Thread B, j = 0
        From Thread C, k = 1
        From Thread A, i = 1
        From Thread C, k = 2
        From Thread B, j = 1
        From Thread C, k = 3
        From Thread A, i = 2
        From Thread C, k = 4
        From Thread B, j = 2
        From Thread C, k = 5
        From Thread A, i = 3

        Exit from C
        From Thread B, j = 3
        From Thread A, i = 4
        From Thread B, j = 4
        From Thread A, i = 5
        From Thread B, j = 5

        Exit from A

        Exit from B
```

/* Write a Simple Java program to demonstrate use of Threads by

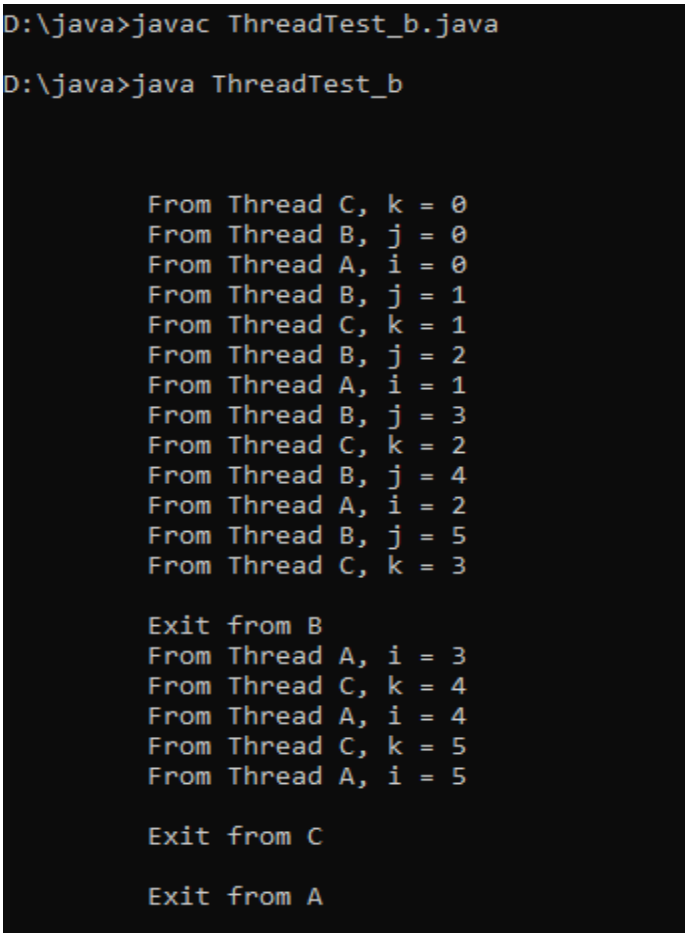
a) Implementing Runnable Interface:
b) By extending Thread class: */

```
//b) By extending Thread class:
class A extends Thread
{
        public void run()
        {
                System.out.println("");
                for(inti=0;i<=5;i++)
                {
                        System.out.println("\t From Thread A, i = "+ i);
                }
                System.out.println("\n\t Exit from A");
        }
```

```
}
class B extends Thread
{
	public void run()
	{
		System.out.println("");
		for(int j=0;j<=5;j++)
		{
			System.out.println("\t From Thread B, j = "+ j);
		}
		System.out.println("\n\t Exit from B");
	}
}
class C extends Thread
{
	public void run()
	{
		System.out.println("");
		for(int k=0;k<=5;k++)
		{
//b) By extending Thread class:

			System.out.println("\t From Thread C, k = "+ k);
		}
		System.out.println("\n\t Exit from C");
	}
}
classThreadTest_b
{
	public static void main(String args[])
	{
		new A().start();
		new B().start();
		new C().start();
	}
```

}

Output:


D:\java>javac ThreadTest_b.java
D:\java>java ThreadTest_b
From Thread C, k = 0
From Thread B, j = 0
From Thread A, i = 0
From Thread B, j = 1
From Thread C, k = 1
From Thread B, j = 2
From Thread A, i = 1
From Thread B, j = 3
From Thread C, k = 2
From Thread B, j = 4
From Thread A, i = 2
From Thread B, j = 5
From Thread C, k = 3
Exit from B
From Thread A, i = 3
From Thread C, k = 4
From Thread A, i = 4
From Thread C, k = 5
From Thread A, i = 5
Exit from C
Exit from A

Assignment 18

/* Write a Simple Java program to demonstrate suspend(), resume() and stop() methods of a thread */

```
classsus_res_stop implements Runnable
{
	Thread Th;
	booleansuspend_flag, stop_flag;
	sus_res_stop(String tN)
	{
		Th = new Thread(this, tN);
		suspend_flag = false;
		stop_flag = false;
		Th.start();
	}
	public void run()
	{
		try
		{
			int j=1;
			while(++j<20)
			{
				synchronized(this)
				{
					while(suspend_flag)
					{wait();}
					if(stop_flag);
					{break;}
				}
			}
		}
		catch(InterruptedException IE)
		{
			System.out.println("\n\t Thread Interrupted !");
		}
	}
```

```
	synchronized void my_suspend()
	{suspend_flag = true;}
/* Write a Simple Java program to demonstrate suspend(), resume() and stop()
methods of a thread */

	synchronized void my_resume()
	{suspend_flag = false;notify();}

	synchronized void my_stop()
	{suspend_flag = false;stop_flag=true;notify();}
}
public class ThreadSRS
{
	public static void main(String args[])
	{
		try
		{
			sus_res_stop t1 = new sus_res_stop("SRS");
			System.out.println("\t Thread SRST is created & started");
			Thread.sleep(2000);
			t1.my_suspend();
			System.out.println("\t Thread SRST is suspended");
			Thread.sleep(2000);
			t1.my_resume();
			System.out.println("\t Thread SRST is resumed");
			Thread.sleep(2000);
			t1.my_suspend();
			System.out.println("\t Thread SRST is suspended");
			Thread.sleep(2000);
			t1.my_resume();
			System.out.println("\t Thread SRST is resumed");
			Thread.sleep(2000);
			System.out.println("\t Thread SRST is stopped");
		}
		catch(InterruptedException IE)
		{
			System.out.println("\t Generated interrupted exception");
```

```
            }
        }
}
```

/* Write a Simple Java program to demonstrate suspend(), resume() and stop() methods of a thread */

Output:

```
D:\java>javac ThreadSRS.java

D:\java>java ThreadSRS
        Thread SRST is created & started
        Thread SRST is suspended
        Thread SRST is resumed
        Thread SRST is suspended
        Thread SRST is resumed
        Thread SRST is stopped
```

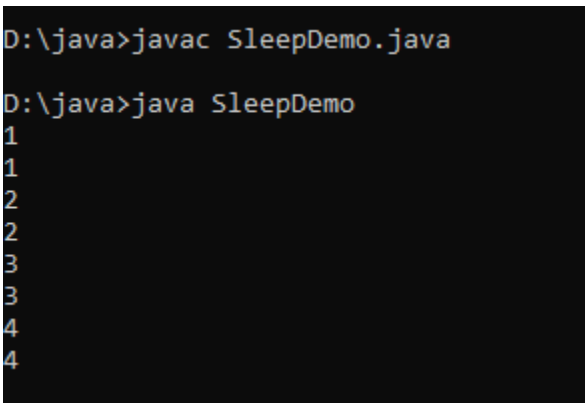
Assignment 19

/*Write a java program to demonstrate sleep(), wait(), notify(), notifyall(), yield() methods of a thread. */

//Java program to illustrate sleep() method in Java

```
classSleepDemo extends Thread
{
	public void run()
	{
		for(inti=1;i<5;i++)
		{
			try
			{
				Thread.sleep(500);
			}
			catch(InterruptedException e)
			{
				System.out.println(e);
			}
			System.out.println(i);
		}
	}
public static void main(String args[])
{
	SleepMethod t1=new SleepMethod();
	SleepMethod t2=new SleepMethod();
	t1.start();
	t2.start();
}
}
```

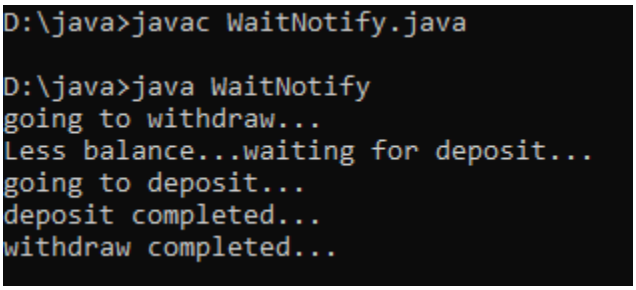
Output:



```
// Java program to illustrate wait() & notify()method in Java

class Customer
{
	int amount=10000;
	synchronized void withdraw(int amount)
	{
		System.out.println("going to withdraw...");
		if(this.amount<amount)
		{
			System.out.println("Less balance...waiting for deposit...");
			try
			{
				wait();
			}
			catch(Exception e){}
		}
		this.amount-=amount;
		System.out.println("withdraw completed...");
	}
	synchronized void deposit(int amount)
	{
		System.out.println("going to deposit...");
		this.amount+=amount;
		System.out.println("deposit completed... ");
		notify();
	}
}
classWaitNotify
{
	public static void main(String args[])
	{
		final Customer c=new Customer();
```

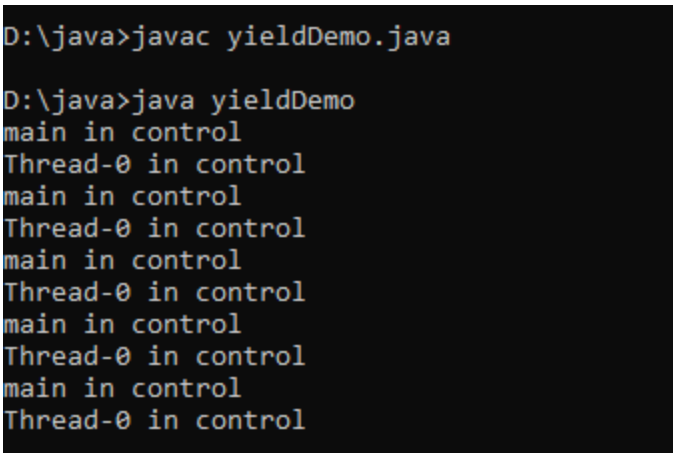
```
            new Thread()
            {
                public void run()
                {
                    c.withdraw(15000);
                }
            }.start();
            new Thread()
            {
                public void run()
                {
                    c.deposit(10000);
                }
            }.start();
        }
}
```

Output:



```
// Java program to illustrate yield() method

classMyThread extends Thread
{
	public void run()
	{
		for (inti=0; i<5 ; i++)
		System.out.println(Thread.currentThread().getName() + " in
control");
	}
}
// Driver Class
public class yieldDemo
{
	public static void main(String[]args)
	{
		MyThread t = new MyThread();
		t.start();
		for (inti=0; i<5; i++)
		{
			// Control passes to child thread
			Thread.yield();
			// After execution of child Thread
			// main thread takes over
			System.out.println(Thread.currentThread().getName()+ " in
control");
		}}}
```

Output:


D:\java>javac yieldDemo.java
D:\java>java yieldDemo
main in control
Thread-0 in control
main in control
Thread-0 in control
main in control
Thread-0 in control
main in control
Thread-0 in control
main in control
Thread-0 in control

Assignment 20

/*Write a Java Program to demonstrate thread priorities */

```
class A extends Thread
{
	public void run()
	{
		System.out.println(" Thread A Started! ");
		for(inti=1;i<4;i++)
		{
			System.out.println(" From thread A: I= "+i);
		}
		System.out.println(" Exit from A! ");
	}}
class B extends Thread
{
	public void run()
	{
		System.out.println(" Thread B Started! ");
		for(int j=1;j<4;j++)
		{
			System.out.println(" From thread B: J= "+j);
		}
		System.out.println(" Exit from B! ");
	}}
class C extends Thread
{
	public void run()
	{
		System.out.println(" Thread C Started! ");
		for(int k=1;k<4;k++)
		{
			System.out.println(" From thread C: K= "+k);
		}
		System.out.println(" Exit from C! ");
	}}
classThreadPriority
```

```
{
	public static void main(String args[])
/*Write a Java Program to demonstrate thread priorities */

	{
		A threadA = new A();
		B threadB = new B();
		C threadC = new C();

		threadC.setPriority(Thread.MAX_PRIORITY);
		threadB.setPriority(threadA.getPriority()+1);
		threadA.setPriority(Thread.MIN_PRIORITY);

		System.out.println("Start thread A ");
		threadA.start();

		System.out.println("Start thread B ");
		threadB.start();

		System.out.println("Start thread C ");
		threadC.start();

		System.out.println("End of main thread!");
	}}
```

Output:

```
D:\java>javac ThreadPriority.java

D:\java>java ThreadPriority
Start thread A
Start thread B
 Thread A Started!
Start thread C
 Thread B Started!
End of main thread!
 Thread C Started!
 From thread B: J= 1
 From thread C: K= 1
 From thread B: J= 2
 From thread C: K= 2
 From thread B: J= 3
 From thread C: K= 3
 Exit from B!
 Exit from C!
 From thread A: I= 1
 From thread A: I= 2
 From thread A: I= 3
 Exit from A!
```

Assignment 21

/*Write a Java Program to demonstrate the concept of Daemon thread */

```
public class ThreadDaemon extends Thread
{
	public void run()
	{
		if(Thread.currentThread().isDaemon())
		{
			System.out.println("Daemon Thread work");
		}

		else
		{
			System.out.println("user thread work");
		}
	}
	public static void main(String args[])
	{
		ThreadDaemon t1 = new ThreadDaemon();//creating thread
		ThreadDaemon t2 = new ThreadDaemon();
```

```
            ThreadDaemon t3 = new ThreadDaemon();
            t1.setDaemon(true);//now t1 is Daemon thread
            t1.start();//starting threads
            t2.start();
            t3.start();
        }
}
```

Output:

```
D:\java>javac ThreadDaemon.java

D:\java>java ThreadDaemon
user thread work
Daemon Thread work
user thread work
```

Assignment 22

/*Write a java program to illustrate thread synchronization */

```
class Table
{
	synchronized void printTable(int n)
	{
		for(inti=1;i<=5;i++)
		{
			System.out.println(n*i);
			try
			{
				Thread.sleep(400);
			}catch(Exception e)
			{
				System.out.println(e);
			}
		}
	}
}
class MyThread1 extends Thread
{
	Table t;
	MyThread1(Table t)
	{
		this.t=t;
	}
	public void run()
	{
		t.printTable(5);
	}
}
class MyThread2 extends Thread
{
	Table t;
	MyThread2(Table t)
```

```
        {
                this.t=t;
        }
        public void run()
        {
                t.printTable(100);
        }
}
public class TestSynchronization2
{
        public static void main(String args[])
        {
                Table obj = new Table();//only one object
                MyThread1 t1=new MyThread1(obj);
                MyThread2 t2=new MyThread2(obj);
                t1.start();
                t2.start();
        }
}
```

Output:

```
D:\java>javac TestSynchronization2.java

D:\java>java TestSynchronization2
5
10
15
20
25
100
200
300
400
500
```

Assignment 23

/*Write a Java Program to demonstrate exception handling mechanism

a) Default throw & our catch
b) Our catch & our throw */

```
//a) Default throw & our catch

public class JavaExceptionExample
{
public static void main(String args[])
 {
try
  {
    //code that may raise exception
int data=100/0;
        System.out.println("It will not be displayed");
  }
catch(ArithmeticException e)
  {
System.out.println(e);
        System.out.println("Division by zero not allowed");
   }
  //rest code of the program
System.out.println("will get exceuted...");
 }
}
```

Output:

```
D:\>cd java

D:\java>javac JavaExceptionExample.java

D:\java>java JavaExceptionExample
java.lang.ArithmeticException: / by zero
Division by zero not allowed
will get exceuted...
```

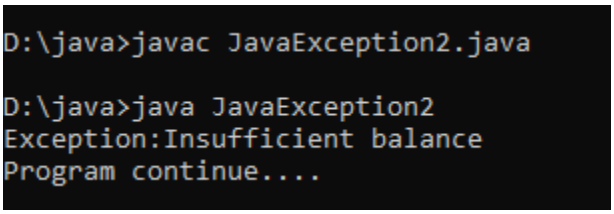
/*Write a Java Program to demonstrate exception handling mechanism

a) Default throw & our catch
b) Our catch & our throw */

//b)Our catch & our throw

```
class JavaException2
{
public static void main(String args[])
  {
intbal=5000;
intwithdrawAmt=6000;
try
    {
            if(bal<withdrawAmt) throw new ArithmeticException("Insufficient
balance");
                bal=bal-withdrawAmt;
                System.out.println("Transaction sucessfully completed");
            }
catch(ArithmeticException e)
            {
            System.out.println("Exception:"+e.getMessage());
            }
            System.out.println("Program continue....");
  }
}
```

Output:


D:\java>javac JavaException2.java
D:\java>java JavaException2
Exception:Insufficient balance
Program continue....

Assignment 24

/* Write a java program for accepting user input through applet*/

```
importjava.awt.*;
importjava.applet.*;
/*
<applet code=Applet1.class height=400 width=400>
</applet>
*/
public class Applet1 extends Applet {
TextField text1,text2;
public void init(){
      text1 = new TextField(8);
      text2 = new TextField(8);
add(text1);
add(text2);
text1.setText("0");
text2.setText("0");
   }
public void paint(Graphics g){
int x=0,y=0,z=0;
      String s1,s2,s;
g.drawString("Input a number in each box :",10,50);
try{
         s1=text1.getText();
         x=Integer.parseInt(s1);
         s2=text2.getText();
         y=Integer.parseInt(s2);
      }
catch(Exception ex){}
      z=x+y;
      s=String.valueOf(z);
g.drawString("The sum is :", 10, 75);
g.drawString(s, 100, 75);
   }
publicboolean action(Event event,Object object){
```

```
repaint();
return true;
  /* Write a java program for accepting user input through applet*/


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

   }
}
```

Output:

Assignment 25

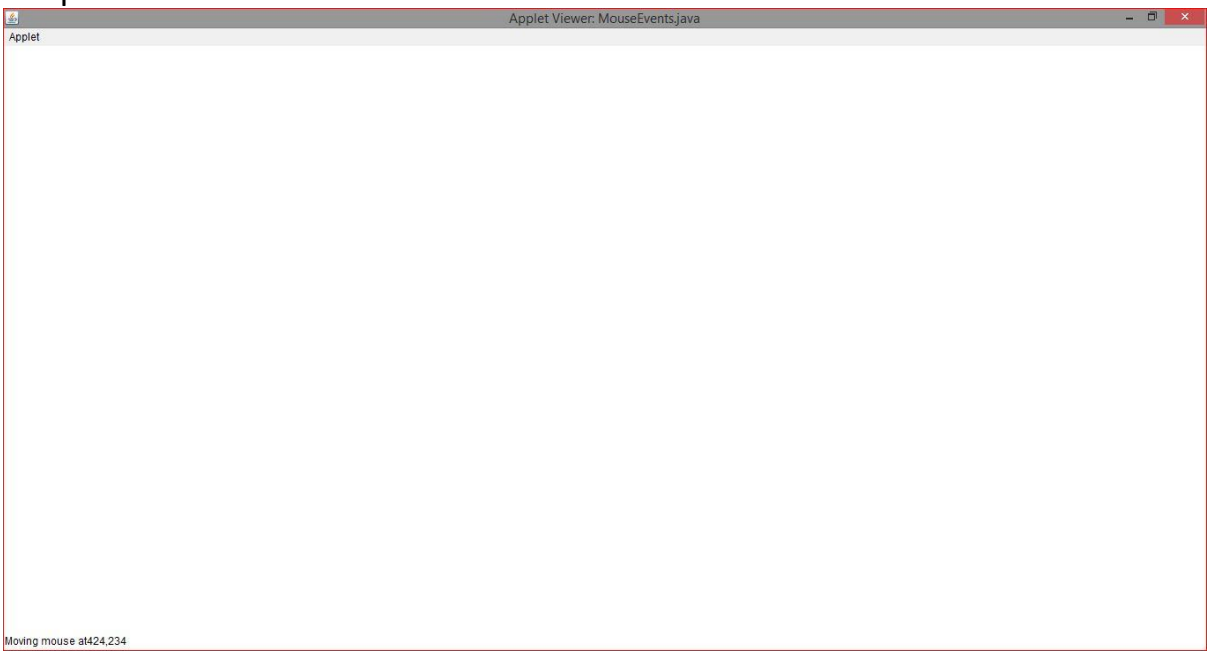
/* Create a java applet to demonstrate the various mouse event handlers. */

```
importjava.awt.*;
importjava.awt.event.*;
importjava.applet.*;

/*
<applet code="MouseEvents.java" height=400 width=400>
</applet>
*/

public class MouseEvents extends Applet implements
MouseListener,MouseMotionListener
{
		String msg="";
		intmousex=0,mousey=0;
		public void init()
		{
			addMouseListener(this);
			addMouseMotionListener(this);
			//setBackground(Color.black);
			//setForeground(Color.red);
		}
		public void mouseEntered(MouseEvent me)
		{
			//setBackground(Color.magenta);
			showStatus("Mouse Entered");
			repaint();
		}
		public void mouseExited(MouseEvent me)
		{
```

```
        //setBackground(Color.black);
        showStatus("Mouse Entered");
        repaint();
    }
    public void mouseClicked(MouseEvent me)
    {
/* Create a java applet to demonstrate the various mouse event handlers. */


        //setBackground(Color.pink);
        msg="Mouse Clicked";
        repaint();
    }
    public void mousePressed(MouseEvent me)
    {
        mousex=me.getX();
        mousey=me.getY();
        msg="Down";
        //setBackground(Color.green);
        repaint();
    }
    public void mouseReleased(MouseEvent me)
    {
        mousex=me.getX();
        mousey=me.getY();
        msg="Up";
        //setBackground(Color.blue);
        repaint();
    }
    public void mouseDragged(MouseEvent me)
    {
        msg="*";
        showStatus("Dragging mouse at"+mousex+","+mousey);
        repaint();
    }
    public void mouseMoved(MouseEvent me)
    {
```

```
                mousex=me.getX();
                mousey=me.getY();
                showStatus("Moving mouse at"+me.getX()+","+me.getY());
                repaint();
        }
        public void paint(Graphics g)
        {
                g.drawString(msg,mousex,mousey);
        }
}
```

Output:

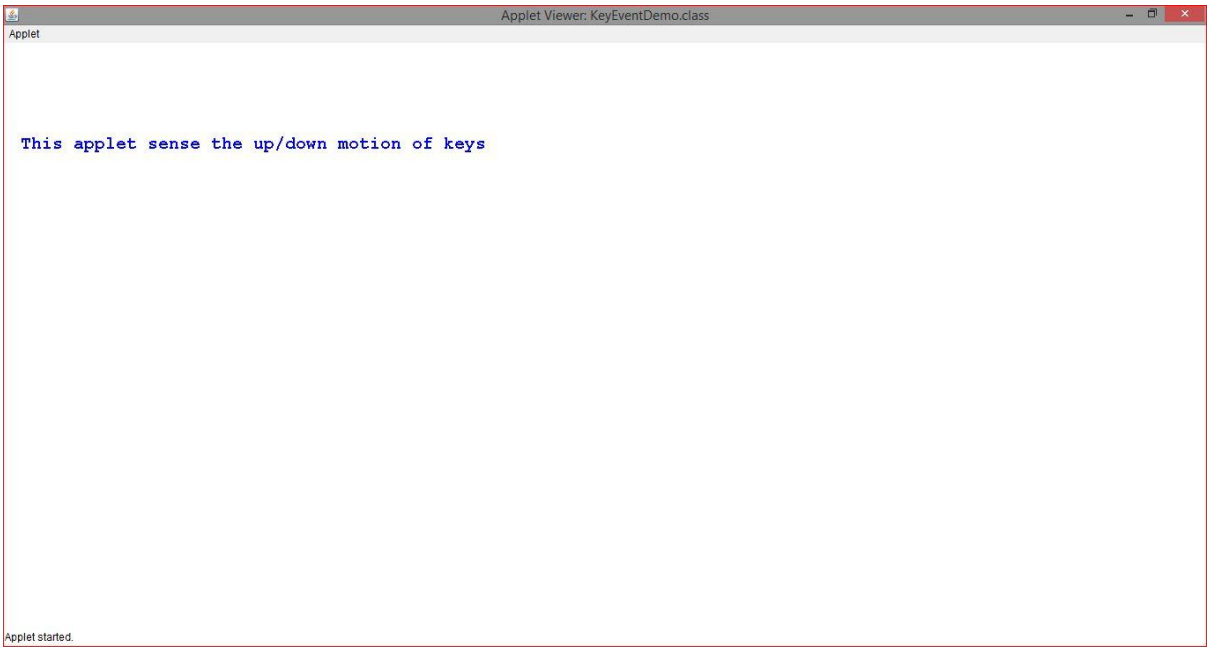


Assignment 26

/* Create a java applet to demonstrate the various keyboard event handlers. */

```
importjava.awt.*;
importjava.awt.event.*;
importjava.applet.*;
/*
<APPLET Code="KeyEventDemo.class" Width=400 Height=300>
</APPLET>
*/
public class KeyEventDemo extends Applet implements KeyListener
{
public void init()
        {
        addKeyListener(this);
        }
        public void keyTyped(KeyEvent KB){}
        public void keyReleased (KeyEvent KB)
        {
        showStatus("key on the keyboard is released");
        }
        public void keyPressed(KeyEvent KB)
        {
        showStatus("A key on the keyboard is pressed");
        }
        Font f1= new Font("Courier New",Font.BOLD,20);
        public void paint(Graphics GA)
        {
        GA.setFont(f1);
                GA.setColor(Color.blue);
                GA.drawString("This applet sense the up/down motion of
keys",20,120);
        }
}
```

Output:


Applet Viewer: KeyEventDemo.class
Applet
This applet sense the up/down motion of keys
Applet started.

Assignment 27

/*Create a java applet to demonstrate various graphics methods*/

```
importjava.awt.*;
importjava.applet.*;
/*
<applet code="grmethods" height=400 width=400>
</applet>
*/
public class grmethods extends Applet
{
String s = new String();
String s1 = new String();
String s2 = new String();
Font f1 = new Font("Courier New",Font.BOLD,20);
public void paint(Graphics g)
{
g.setFont(f1);
g.setColor(Color.blue);
g.drawString("illustration of the methods of graphics class",200,520);
Font f2=g.getFont();
s=f2.toString();
g.drawString(s,5,560);
g.fillRect(500,15,50,90);
g.drawRect(10,120,155,95);
g.setColor(Color.yellow);
g.fillOval(700,140,50,150);
g.setColor(Color.black);
```

```
g.drawLine(380,100,200,180);
g.drawArc(400,150,180,280,90,180);
int x2[]={200,120,280,240};
int y2[]={260,370,370,270};
g.setColor(Color.blue);
g.fillPolygon(x2,y2,4);
g.setColor(Color.red);
g.drawRect(15,15,30,50);
FontMetrics f3=g.getFontMetrics();
s1=f3.toString();
g.drawString(s1,5,580);
g.setColor(Color.magenta);
g.fillRoundRect(510,400,80,80,10,10);
}
}
```

Output: