JAVA LAB MANNUAL

BY

Name:

Roll No.

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MASTER OF COMPUTER APPLICATION

SIDDHANT INSTITUTE OF COMPUTER APPLICATION,

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ACADEMIC YEAR 2022-2023

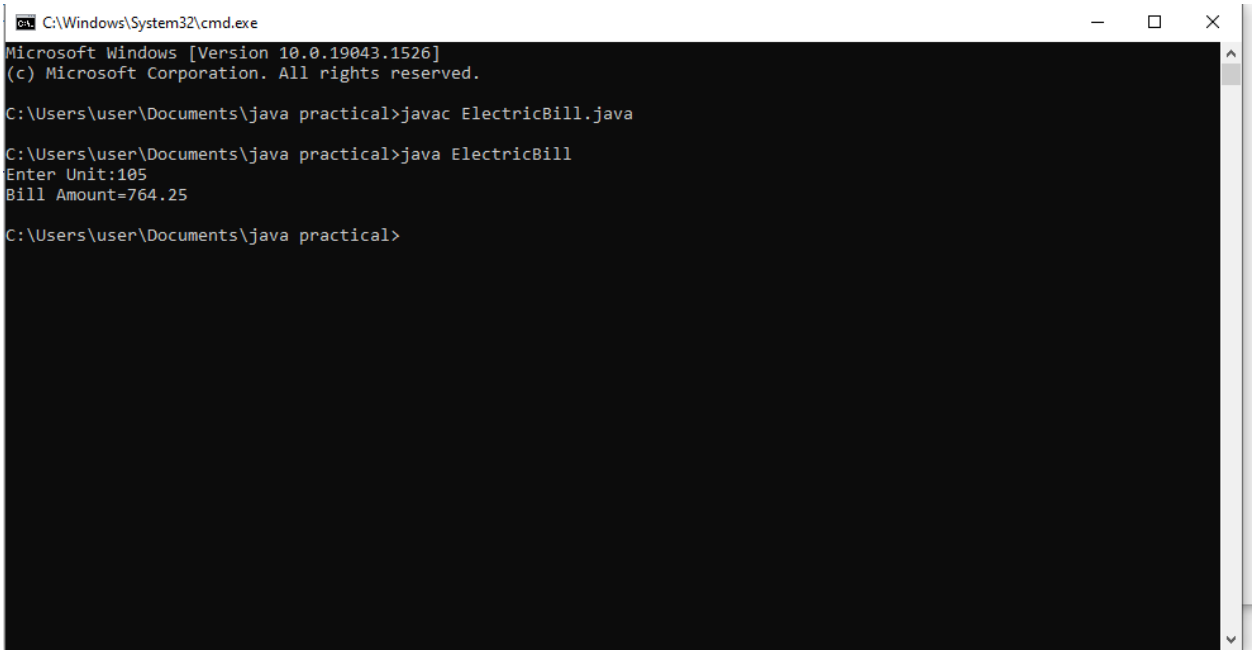
1) **Write a Java program to calculate the electricity bill for the given unit.**

Fixed Price	Unit	Charges per unit
100	0-100	6.30
100	101-200	6.85
100	>200	7.40

```
import java.util.Scanner;

public class ElectricBill

{

public static void main(String args[])

        {

                Scanner sc = new Scanner(System.in);

                System.out.print("Enter Unit:");

                        int unit=sc.nextInt();

                        double bill=calculateElectricBill(unit);

                        System.out.println("Bill Amount="+bill);

        }

                public static double calculateElectricBill(int unit)

                {

                        double fixed_price=100;

                        double rate0_100=6.30;

                        double rate101_200=6.85;

                        double ratemorethan200=7.40;
```

```
            if(unit<=100)
            {
                return fixed_price+(unit*rate0_100);
            }
            else if(unit<=200)
            {
                return (fixed_price+(100*rate0_100)+(unit-100)*rate101_200);
            }
            else
            {
                return (fixed_price+(100*rate0_100)+(100*rate101_200)+(unit-
                200)*ratemorethan200);
            }
        }
}
```

Output:



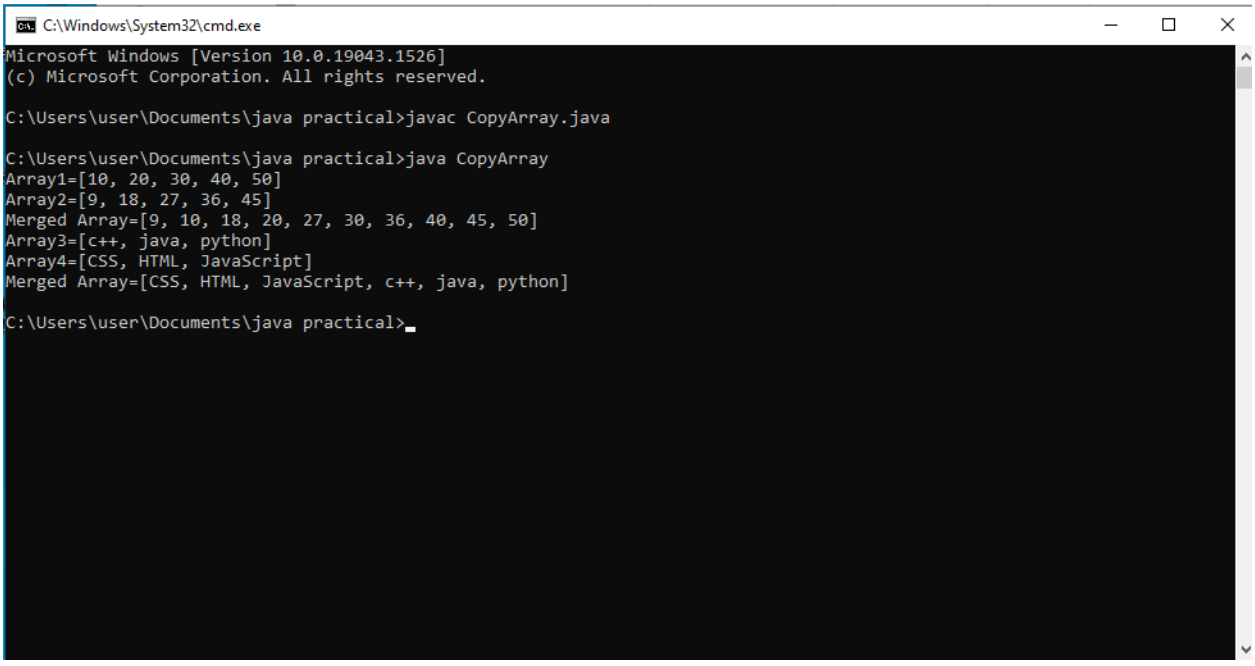
2) Write a program to merge two sorted arrays into one sorted array in Java.

Example of merging of two int arrays,
Array1 = [10, 20, 30, 40, 50]
Array2 = [9, 18, 27, 36, 45]
Then the result should be,
Merged Array = [9, 10, 18, 20, 27, 30, 36, 40, 45, 50]
Example of merging of two String array,
Array1 = [C++, Java, Python]
Array2 = [CSS, HTML, JavaScript]
Then the result should be,
Merged Array = [C++, CSS, HTML, Java, JavaScript, Python]

```
import java.util.Arrays;

public class CopyArray

{

	public static void main(String args[])

	{

		int src1[]={10,20,30,40,50};

		int src2[]={9,18,27,36,45};

		int newArray[]=new int[src1.length+src2.length];

		System.arraycopy(src1,0,newArray,0,src1.length);

		System.arraycopy(src2,0,newArray,src1.length,src2.length);

		Arrays.sort(newArray);

		System.out.println("Array1="+Arrays.toString(src1));

		System.out.println("Array2="+Arrays.toString(src2));

		System.out.println("Merged Array="+Arrays.toString(newArray));

		String src3[]={"c++","java","python"};
```

```
        String src4[]={"CSS","HTML","JavaScript"};
        String newArray1[]=new String[src3.length+src4.length];
        System.arraycopy(src3,0,newArray1,0,src3.length);
        System.arraycopy(src4,0,newArray1,src3.length,src4.length);
        Arrays.sort(newArray1);
        System.out.println("Array3="+Arrays.toString(src3));
        System.out.println("Array4="+Arrays.toString(src4));
        System.out.println("Merged Array="+Arrays.toString(newArray1));
    }
}
```

Output:

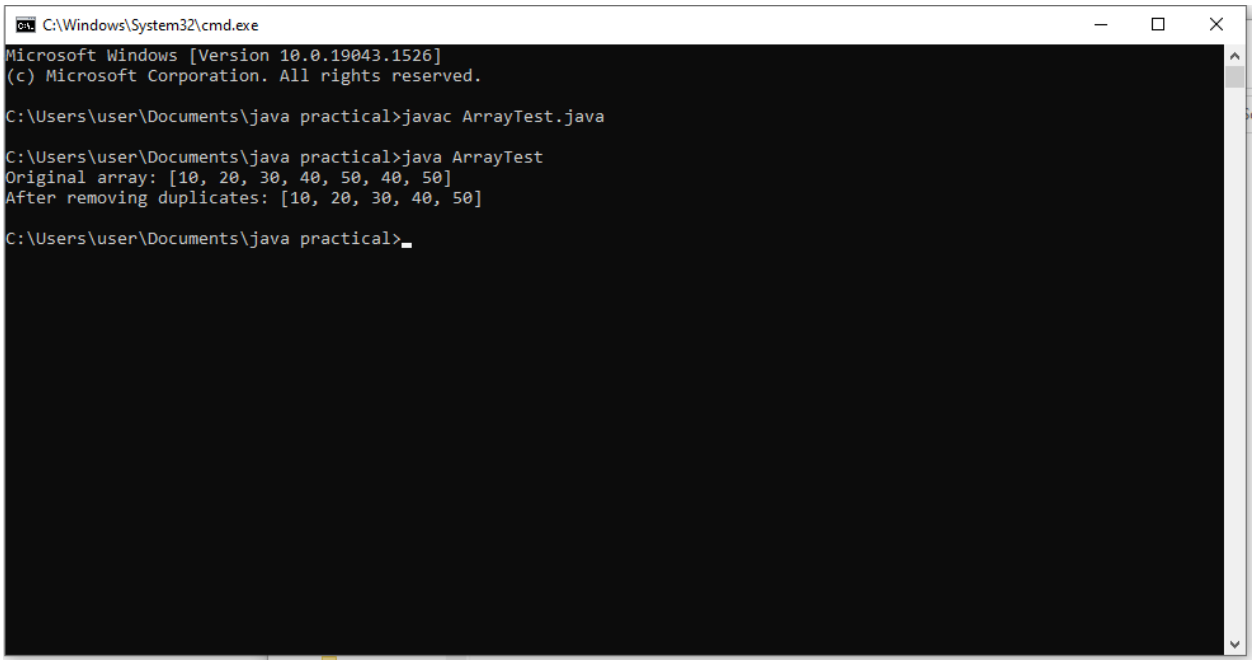


3) Java program to remove duplicates from sorted array

```
import java.util.Arrays;

public class ArrayTest
{

public static void main(String[]args)

{

int arr[]={10,10,20,30,40,40,50};

int newArr[]=removeDuplicates(arr);

System.out.println("Original array: "+Arrays.toString(arr));

System.out.println("After removing duplicates: "+Arrays.toString(newArr));

}

public static int[] removeDuplicates(int[]arr)

{

int j =0;

int lastIndex=arr.length-1;

for(int i=0;i<lastIndex;i++)

{

if(arr[i]!=arr[i+1])

{

arr[j++]=arr[i];

}

}

if(arr[j]!=arr[lastIndex])

arr[j++]=arr[lastIndex];
```

```
            return Arrays.copyOf(arr, j);
        }
}
```

Output:



4) Transpose of a Matrix in Java

```
12
34
```

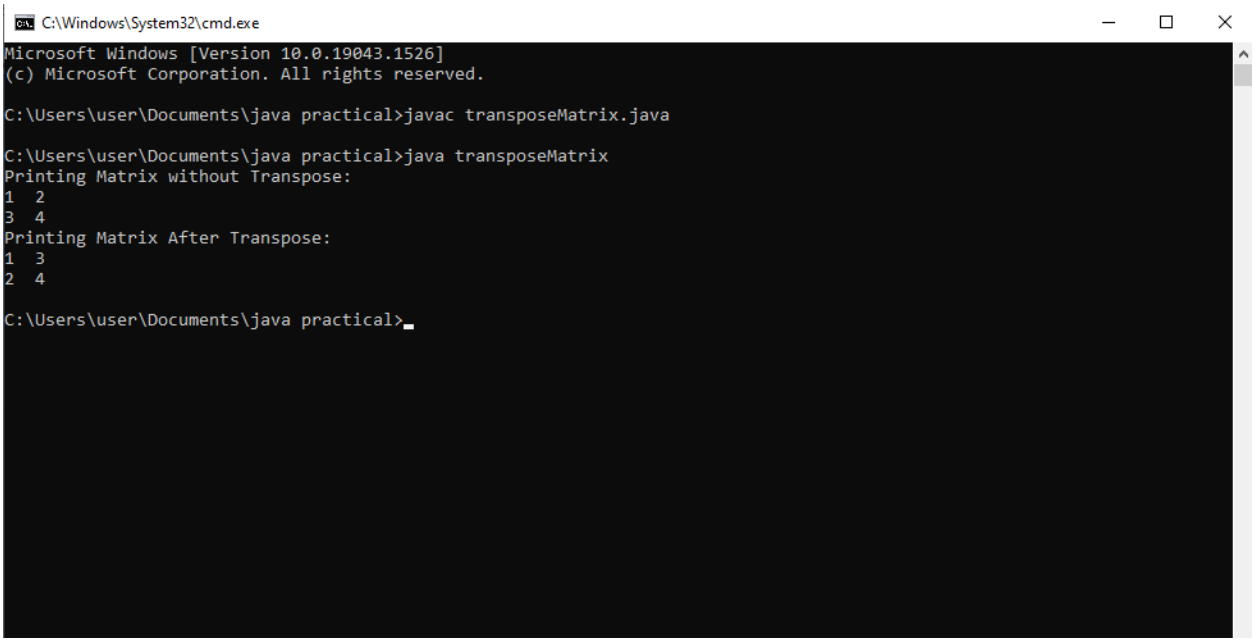
Then the transpose of a matrix,

```
13
24
```

```
class transposeMatrix
{
	public static void main(String args[])
	{
		int original[][]={{1,2},{3,4}};
		int transpose[][]=new int[2][2];
		for(int i=0;i<2;i++)
			{
				for(int j=0; j<2;j++)
				{
					transpose[i][j]=original[j][i];
				}
			}
		System.out.println("Printing Matrix without Transpose:");
		for(int i=0;i<2;i++)
			{
				for(int j=0; j<2;j++)
				{
					System.out.print(original[i][j]+"  ");
				}
				System.out.println();
			}
		System.out.println("Printing Matrix After Transpose:");
		for(int i=0;i<2;i++)
			{
				for(int j=0; j<2;j++)
				{
					System.out.print(transpose[i][j]+"  ");
```

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

Output:

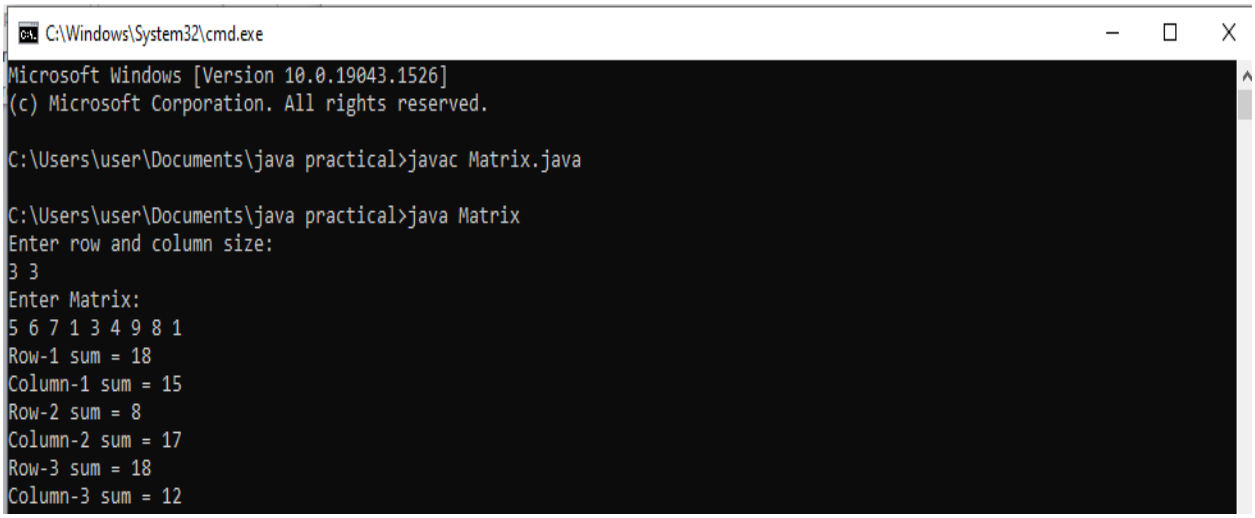


5) Write a Java program to find the sum of each row and the sum of each column in a given matrix.

```
import java.util.Scanner;
public class Matrix
{
 public static void main(String[]args)
{
  int row =0;
  int column =0;
  int a[][]=null;
  Scanner scan =new Scanner(System.in);
  System.out.println("Enter row and column size: ");
  row =scan.nextInt();
  column =scan.nextInt();
  a =new int[row][column];
  System.out.println("Enter Matrix: ");
  for(int i=0;i<a.length;i++)
        {
                for(int j =0; j<a[0].length;j++)
                {
                a[i][j]=scan.nextInt();
                }
        }
  int rowsum;
  int columnsum;
  for(int i=0;i<3;i++)
        {
            rowsum=0;
            columnsum=0;
            for(int j=0; j<3;j++)
                {
                rowsum+= a[i][j];
                columnsum+= a[j][i];
                }
           System.out.println("Row-"+(i+1)+" sum = "+rowsum);
       System.out.println("Column-"+(i+1)+" sum = "+columnsum);
        }
  scan.close();
```

```
    }

}
```

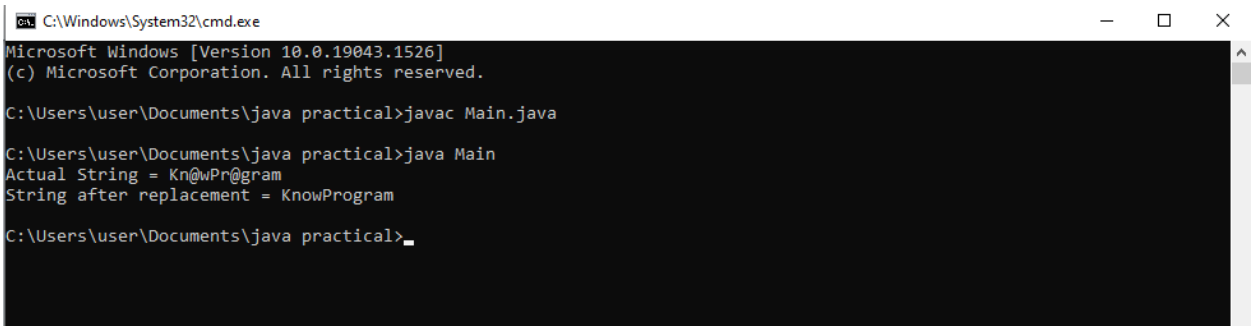
Output:


C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.19043.1526]
(c) Microsoft Corporation. All rights reserved.
C:\Users\user\Documents\java practical>javac Matrix.java
C:\Users\user\Documents\java practical>java Matrix
Enter row and column size:
3 3
Enter Matrix:
5 6 7 1 3 4 9 8 1
Row-1 sum = 18
Column-1 sum = 15
Row-2 sum = 8
Column-2 sum = 17
Row-3 sum = 18
Column-3 sum = 12

6) Write a java program to Remove Special Characters from String

```
public class Main
{
        public static void main(String[]args)
        {
                String string="Kn@wPr@gram";
                System.out.println("Actual String = "+string);

                string=string.replaceAll("[@]","o");
                System.out.println("String after replacement = "+string);
        }
}
```

Output:

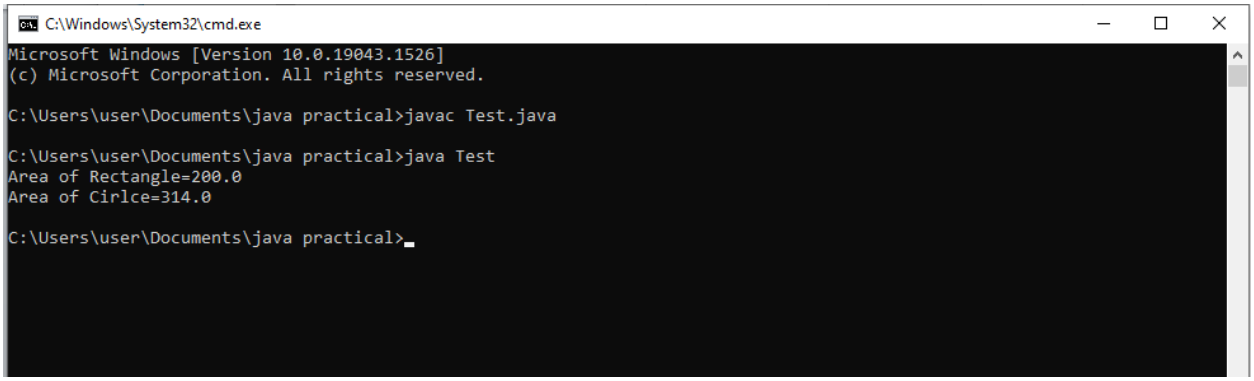


7) WAP to implement interface in java

```
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 (x*y);
	}
}
class   Circle   implements   Area
{
	public float compute(float x,float y)
	{
		return(pi*x*x);
	}
}
class Test
{
	public static void main(String args[])
```

```
    {
        Rectangle rect=new Rectangle();
        Circle cir=new Circle();
        Area area;area=rect;
        System.out.println("Area of Rectangle="+area.compute(10,20));
        area=cir;
        System.out.println("Area of Cirlce="+area.compute(10,10));
    }
}
```

Output:

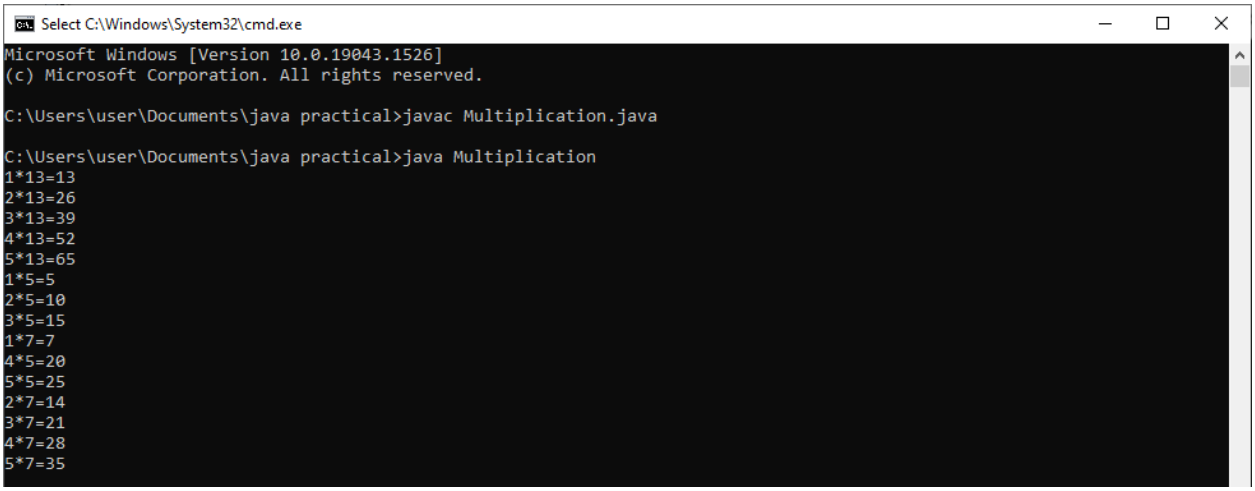


8) Write a java program to implement thread methods

```
import java.lang.Thread;
class A extends Thread
{
	public void run()
	{
		for(int i=1;i<=5;i++)
		{
			System.out.println(i+"*5="+(i*5));
		}
	}
}
class B extends Thread
{
	public void run()
	{
		for(int i=1;i<=5;i++)
		{
			System.out.println(i+"*7="+(i*7));
		}
	}
}
class C extends Thread
```

```
{
        public void run()
        {
                for(int i=1;i<=5;i++)
                {
                        System.out.println(i+"*13="+(i*13));
                }
        }
}
class  Multiplication
{
        public static void main(String args[])
        {
                A a1=new A();
                B b1=new B();
                C c1=new C();
                a1.start();
                b1.start();
                c1.start();
        }
}
```

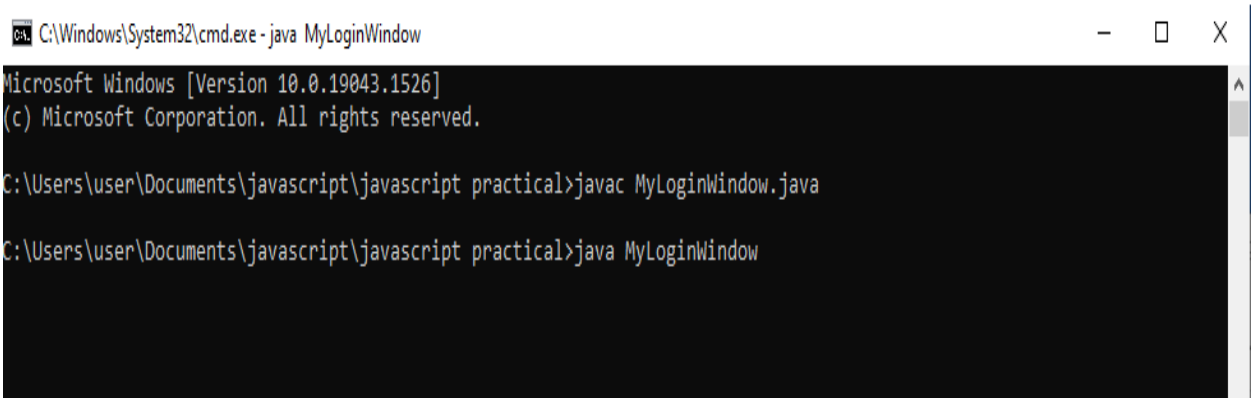
Output:

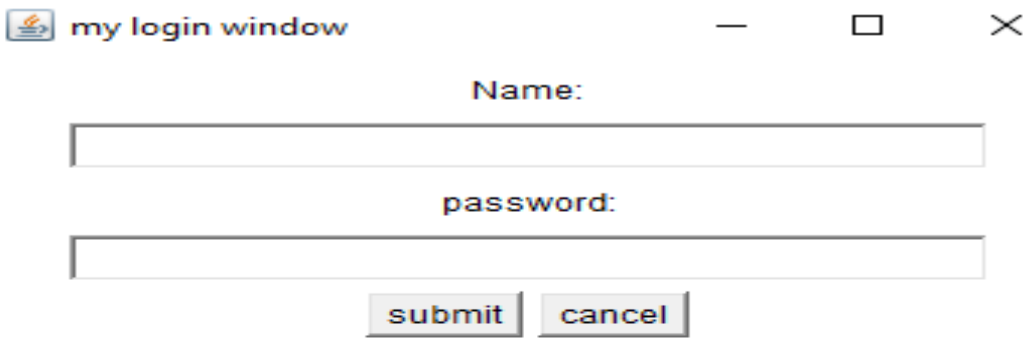

Select C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.19043.1526]
(c) Microsoft Corporation. All rights reserved.
C:\Users\user\Documents\java practical>javac Multiplication.java
C:\Users\user\Documents\java practical>java Multiplication
1*13=13
2*13=26
3*13=39
4*13=52
5*13=65
1*5=5
2*5=10
3*5=15
1*7=7
4*5=20
5*5=25
2*7=14
3*7=21
4*7=28
5*7=35

9) Write a java program to implement packages.

```
import java.awt.*;
import java.awt.event.*;
class MyLoginWindow extends Frame
{

        public static void main(String args[])
        {
                Frame f=new Frame();
                f.setLayout(new FlowLayout());
                f.setVisible(true);
                f.setSize(400,400);
                f.setTitle("my login window");
                Label n=new Label("Name:",Label.CENTER);
                Label p=new Label("password:",Label.CENTER);
                TextField t1=new TextField(40);
                TextField t2=new TextField(40);
                t2.setEchoChar('#');
                Button b1=new Button("submit");
                Button b2=new Button("cancel");
                f.add(n);
                f.add(t1);
                f.add(p);
                f.add(t2);
                f.add(b1);
                f.add(b2);
                n.setBounds(70,90,90,60);
                p.setBounds(70,130,90,60);
                t1.setBounds(200,100,90,20);
                t2.setBounds(200,140,90,20);
                b1.setBounds(100,260,70,40);
                b2.setBounds(180,260,70,40);
        }
}
```

Output:


C:\Windows\System32\cmd.exe - java MyLoginWindow
Microsoft Windows [Version 10.0.19043.1526]
(c) Microsoft Corporation. All rights reserved.
C:\Users\user\Documents\javascript\javascript practical>javac MyLoginWindow.java
C:\Users\user\Documents\javascript\javascript practical>java MyLoginWindow


my login window
Name:
password:
submit
cancel

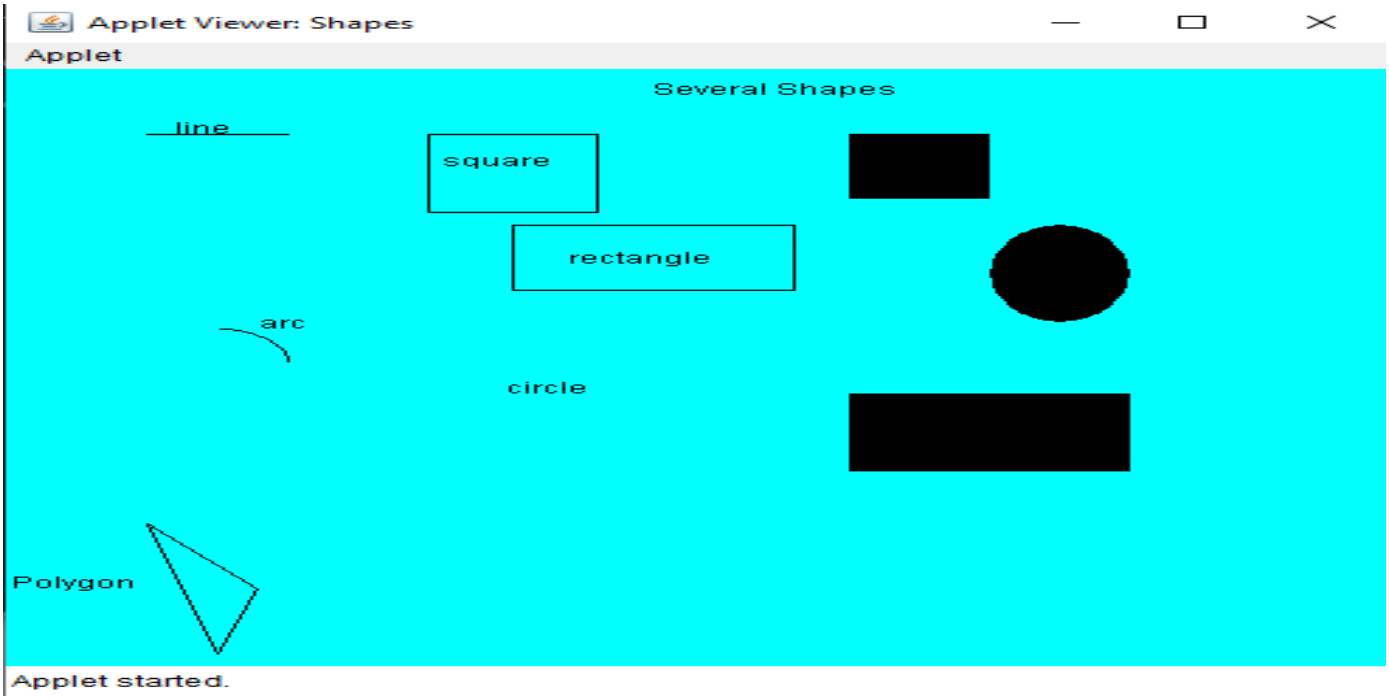
10) WAP to DESIGN APPLET

```
import java.awt.*;
import java.applet.*;
public class Shapes extends Applet
{
	String Polygon;
	int p;
	public void init()
	{
		setBackground(Color.cyan);
	}
	public void paint(Graphics g)
	{
		g.drawString("Several Shapes",230,20);
		int x[]={50,89,75};
		int y[]={350,400,450};
		g.drawString("Polygon",2,400);
		Polygon p=new Polygon(x,y,3);
		g.drawPolygon(p);
		g.drawString("line",60,50);
		g.drawLine(50,50,100,50);
		g.drawString("square",155,75);
		g.drawRect(150,50,60,60);
```

```
                g.drawString("rectangle",200,150);
                g.drawRect(180,120,100,50);
                g.fillRect(300,50,50,50);
                g.drawString("circle",178,250);
                g.fillRect(300,250,100,60);
                g.fillOval(350,120,50,75);
                g.drawString("arc",90,200);
                g.drawArc(50,200,50,50,0,90);
        }
}
<html>
<applet code="Shapes"height=400  width=400>
</applet>
</html>
```

Output:

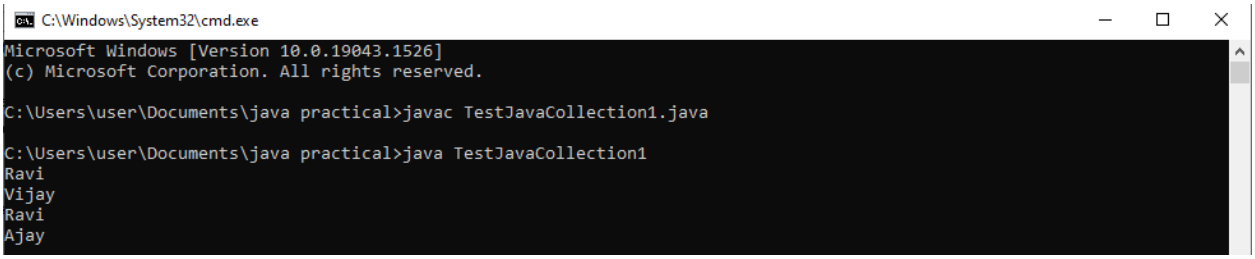
```
C:\Windows\System32\cmd.exe - appletviewer Shapes.html
Microsoft Windows [Version 10.0.19043.1526]
(c) Microsoft Corporation. All rights reserved.

C:\Users\user\Documents\java practical>javac Shapes.java

C:\Users\user\Documents\java practical>appletviewer Shapes.html
```



11) Collection program using array List

```
import java.util.*;

class TestJavaCollection1

{

	public static void main(String args[])

	{

		ArrayList<String> list=new ArrayList<String>();

		list.add("Ravi");

		list.add("Vijay");

		list.add("Ravi");

		list.add("Ajay");

		Iterator itr=list.iterator();

		while(itr.hasNext())

		{

			System.out.println(itr.next());

		}

	}

}
```

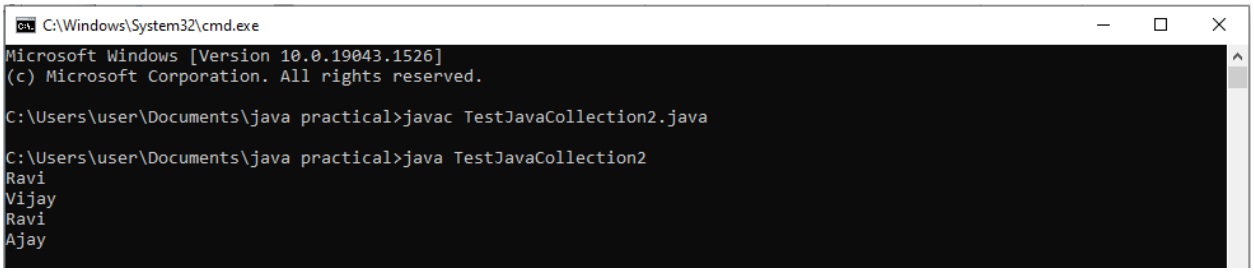
Output:



12) Collection program using array List and Linked list

```
import java.util.*;

public class TestJavaCollection2

{

	public static void main(String args[])

	{

		LinkedList<String> al=new LinkedList<String>();

		al.add("Ravi");

		al.add("Vijay");

		al.add("Ravi");

		al.add("Ajay");

		Iterator<String> itr=al.iterator();

		while(itr.hasNext())

		{

			System.out.println(itr.next());

		}

	}

}
```

Output:



13) Design a and implement JDBC applications

```
import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.SQLException;

import java.sql.Statement;

public class JDBCExample {

{


      try{

         Class.forName("com.mysql.cj.jdbc.Driver");

         Connection con=DriverManager.getConnection("jdbc:mysql://localhost:3306/
students","root","vaibhavi123");

      }

       catch(Exception e){

         }

}

      static final String DB_URL ="jdbc:mysql://localhost:3306/students";

          static final String USER ="root";

          static final String PASS ="vaibhavi123";

   public static void main(String[] args) {

  try(Connection con =DriverManager.getConnection(DB_URL, USER, PASS);

                    Statement stmt=con.createStatement();

                    ){
```

```
                String sql="CREATE DATABASE STUDENTS";
                stmt.executeUpdate(sql);
                System.out.println("Database created successfully...");
            }
            catch(SQLException e)
            {
                e.printStackTrace();
            }
    }

}
```

Output: