

Lab Practicals

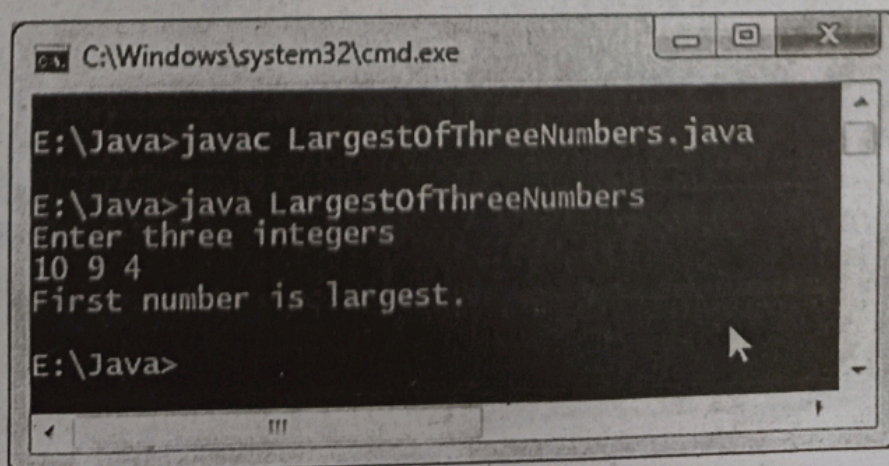
1. Write a program to find the largest of n natural numbers.

Ans :

Largest of given three numbers

```
import java.util.Scanner;
class LargestOfThreeNumbers
{
public static void main(String args[])
{
    int x, y, z;
    System.out.println("Enter three integers ");
        Scanner in = new Scanner(System.in);
        x = in.nextInt();
        y = in.nextInt();
        z = in.nextInt();
    if ( x > y && x > z )
        System.out.println("First number is largest.");
    else if ( y > x && y > z )
        System.out.println("Second number is largest.");
    else if ( z > x && z > y )
        System.out.println("Third number is largest.");
    else
        System.out.println("Entered numbers are not distinct.");
    }
}
```

Output



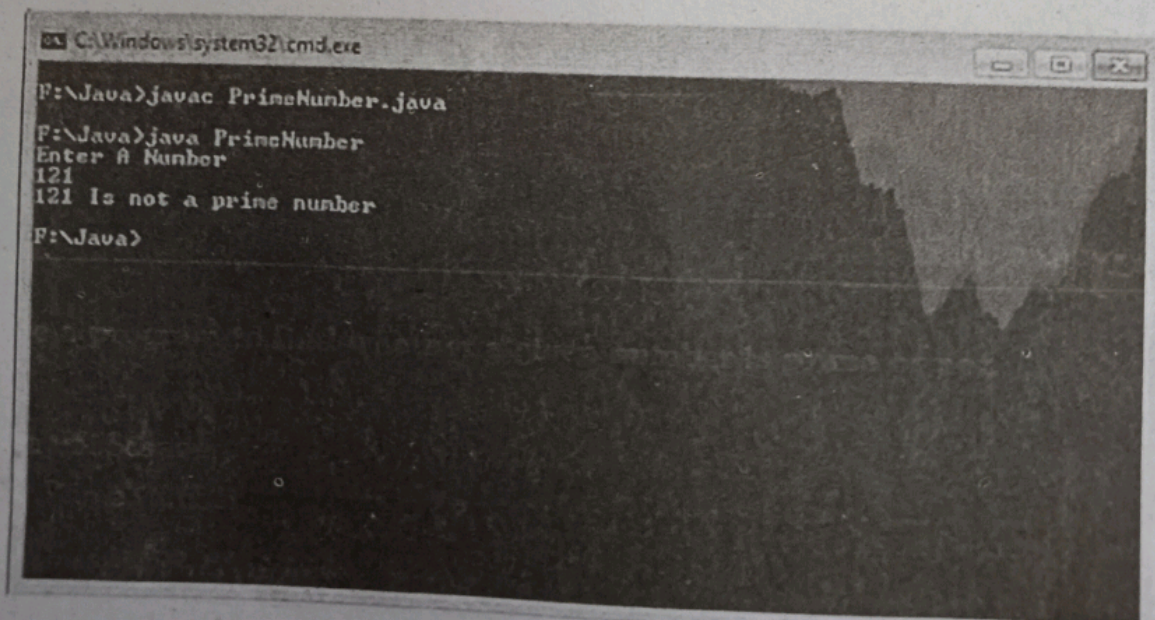
```
C:\Windows\system32\cmd.exe
E:\Java>javac LargestOfThreeNumbers.java
E:\Java>java LargestOfThreeNumbers
Enter three integers
10 9 4
First number is largest.
E:\Java>
```

2. Write a program to find whether a given number is prime or not.

Ans :

```
import java.util.Scanner;
public class PrimeNumber
{
    public static void main(String args[])
    {
        int num,b,c;
        Scanner s=new Scanner(System.in);
        System.out.println("Enter A Number");
        num =s.nextInt();
        b=1;
        c=0;
        while(b<= num)
        {
            if((num%b)==0)
            {
                c=c+1;
                b++;
            }
            if(c==2)
            System.out.println(num + " is a prime number");
            else
            System.out.println(num + " is not a prime number");
        }
    }
}
```

Output



```
C:\Windows\system32\cmd.exe
F:\Java>javac PrimeNumber.java
F:\Java>java PrimeNumber
Enter A Number
121
121 is not a prime number
F:\Java>
```

3. Write a menu driven program for following:

- (a) Display a Fibonacci series
- (b) Compute Factorial of a number

Ans :

(a) Display a Fibonacci series

For answer refer to Unit-I, Q.No. 12 (While loop)

(b) Compute Factorial of a number

For answer refer to Unit-I, Q.No. 12 (Do.While loop)

4. Write a program to check whether a given number is odd or even.

Ans :

```
import java.util.Scanner;
public class Odd_Even
{
    public static void main(String[] args)
    {
        int n;
        Scanner s = new Scanner(System.in);
        System.out.print("Enter the number you want to check:");
        n = s.nextInt();
        if(n % 2 == 0)
        {
            System.out.println("The given number "+n+" is Even ");
        }
        else
        {
            System.out.println("The given number "+n+" is Odd ");
        }
    }
}
```

Output

```
javac Odd_Even.java
```

```
java Odd_Even
```

```
Enter the number you want to check:15
```

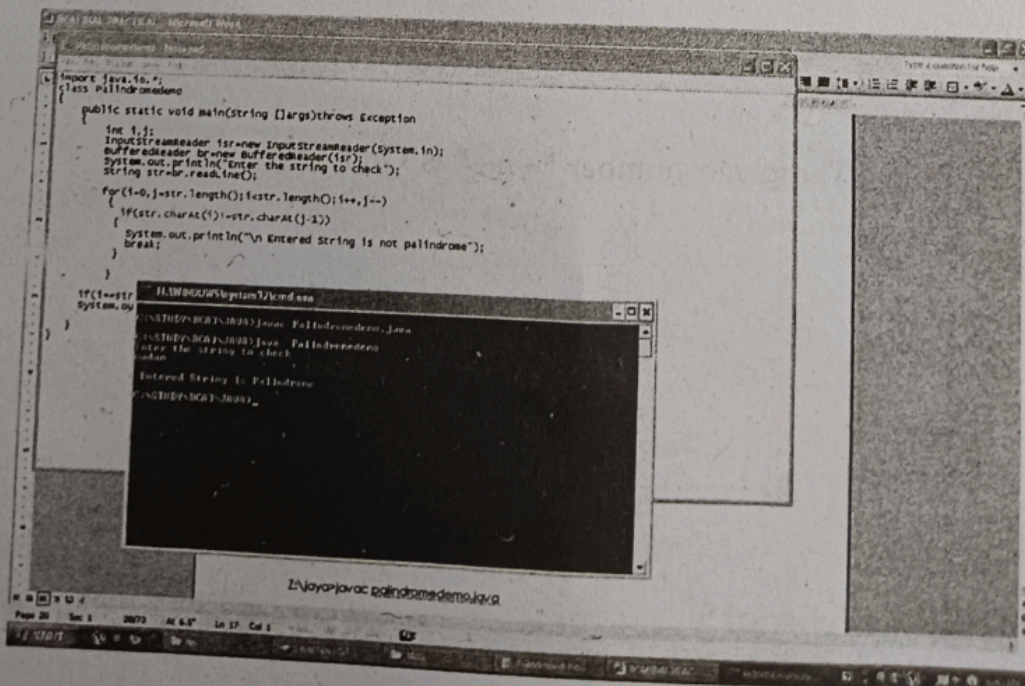
```
The given number 15 is Odd
```

5. Write a program to check whether a given string is palindrome or not.

Ans :

```
import java.io.*;
class Palindromedemo
{
public static void main(String []args) throws Exception
{
    int i,j;
    InputStreamReader isr=new InputStreamReader(System.in);
    BufferedReader br=new BufferedReader(isr);
    System.out.println("Enter the string to check");
    String str=br.readLine();
    for(i=0,j=str.length();i<str.length();i++,j--)
    {
        if(str.charAt(i)!=str.charAt(j-1))
        {
            System.out.println("\n Entered String is not palindrome");
            break;
        }
    }
    if(i==str.length())
    System.out.println("\n Entered String is Palindrome");
}
}
```

Output



6. Write a program to print the sum and product of digits of an Integer and reverse the Integer

Ans :

```
import java.util.Scanner;
public class Use_Do_While
{
    public static void main(String[] args)
    {
        int n, a, m = 0, sum = 0;
        Scanner s = new Scanner(System.in);
        System.out.print("Enter any number:");
        n = s.nextInt();
        do
        {
            a = n % 10;
            m = m * 10 + a;
            sum = sum + a;
            n = n / 10;
        }
        while( n > 0);
        System.out.println("Reverse:"+m);
        System.out.println("Sum of digits:"+sum);
    }
}
```

Output

```
javac Use_Do_While.java
```

```
java Use_Do_While
```

```
Enter any number:456
```

```
Reverse:654
```

```
Sum of digits:15
```

7. Write a program to create an array of 10 integers. Accept values from the user in that Array. Input another number from the user and find out how many numbers are equal to the number passed, how many are greater and how many are less than the number passed.

Ans :

```
import java.util. Scanner;
    public class Array_Ex
    {
        public static void main(String[] args)
        {
            int i,n;
```

```

int equal_count=0, greater_count=0, less_count=0;
Scanner sc=new Scanner(System.in);
int[] arr = new int[10];
System.out.println("Please enter 10 integer values: ");
for(i=0; i<10; i++)
{
    arr[i]=sc.nextInt();
}
System.out.println("Enter Another Value: ");
n=sc.nextInt();
for(i=0; i<10; i++)
{
    if(arr[i]==n)
    {
        equal_count++;
    }
    else if(arr[i]>n)
    {
        greater_count++;
    }
    else
    {
        less_count++;
    }
}
System.out.println("The count of numbers that are equal to the number passed is:
"+equal_count);
System.out.println("The count of numbers that are greater than the number passed is:
"+greater_count);
System.out.println("The count of numbers that are less than the number passed is:
"+less_count);
}

```

Output

```

C:\Users\sure\Desktop\Labwork> javac Array_Ex.java
C:\Users\sure\Desktop\Labwork> java Array_Ex
Please enter 10 integer values:
10 20 30 40 50 60 70 80 90 100
Enter Another Value:
50
The count of numbers that are equal to the number passed is: 1
The count of numbers that are greater than the number passed is: 5
The count of numbers that are less than the number passed is: 4
C:\Users\sure\Desktop\Labwork>

```

8. Write a program that will prompt the user for a list of 5 prices. Compute the average of the prices and find out all the prices that are higher than the calculated average.

Ans :

```
import java.util.Scanner;
public class Average
{
    public static void main(String[] args)
    {
        Scanner sc=new Scanner(System.in);
        int[] arr = new int[5];
        float total = 0, avg;
        System.out.println("Please enter 5 prices: ");
        for(int i=0; i<5; i++)
        {
            arr[i]=sc.nextInt();
        }
        for (int i=0; i<5; i++)
        {
            total = total+ arr[i];
        }
        avg = total/5;
        System.out.println("The average of 5 prices is: "+ avg);
        System.out.println("The Prices that are higher than the calculated average are: ");
        for (int i=0; i<5; i++)
        {
            if(arr[i]>avg)
                System.out.print(arr[i]+" ");
            else
                continue;
        }
    }
}
```

Output

```
C:\Users\sure\Desktop\Labwork> javac Average.java
C:\Users\sure\Desktop\Labwork> java Average
Please enter 5 prices:
21 45 67 35 93
The average of 5 prices is: 52.2
The Prices that are higher than the calculated average are:
67 93
C:\Users\sure\Desktop\Labwork>
```

9. Write a program in java to input N numbers in an array and print out the Armstrong numbers from the set.

Ans :

```
public class Armstrong
{
    public static void main(String[] args)
    {
        int n, count = 0, a, b, c, sum = 0;
        System.out.print("Armstrong numbers from 1 to 1000:");
        for(int i = 1; i <= 1000; i++)
        {
            n = i;
            while(n > 0)
            {
                b = n % 10;
                sum = sum + (b * b * b);
                n = n / 10;
            }
            if(sum == i)
            {
                System.out.print(i+" ");
            }
            sum = 0;
        }
    }
}
```

Output

```
javac Armstrong.java
```

```
java Armstrong
```

```
Armstrong numbers from 1 to 1000:1 153 370 371 407
```

10. Write java program for the following matrix operations:

- (a) Addition of two matrices
- (b) Transpose of a matrix

Ans :

- (a) Addition of two matrices

```
class AddMatrix
{
    public static void main(String args[])
    {
        int row, col,i,j;
```



```
Scanner in = new Scanner(System.in);
System.out.println("Enter the number of rows");
row = in.nextInt();
System.out.println("Enter the number columns");
col = in.nextInt();
int mat1[][] = new int[row][col];
int mat2[][] = new int[row][col];
int res[][] = new int[row][col];
System.out.println("Enter the elements of matrix1");
for ( i= 0 ; i < row ; i++ )
{
    for ( j= 0 ; j < col ; j++ )
        mat1[i][j] = in.nextInt();
    System.out.println();
}
System.out.println("Enter the elements of matrix2");

for ( i= 0 ; i < row ; i++ )
{
    for ( j= 0 ; j < col ; j++ )
        mat2[i][j] = in.nextInt();
    System.out.println();
}

for ( i= 0 ; i < row ; i++ )
    for ( j= 0 ; j < col ; j++ )
        res[i][j] = mat1[i][j] + mat2[i][j];
System.out.println("Sum of matrices:-");
for ( i= 0 ; i < row ; i++ )
{
    for ( j= 0 ; j < col ; j++ )
        System.out.print(res[i][j] + "\t");
    System.out.println();
}
}
```

Output

```
Output
2 2
3 Enter the number columns
4 2
5 Enter the elements of matrix1
6 1 1
7
8 1 1
9
10 Enter the elements of matrix2
11 2 2
12
13 2 2
14
15 Sum of matrices:-
16 3 3
17 3 3
```

(b) Transpose of a matrix

```
public static void main(String args[]){
    //creating a matrix
    int original[][]={{1,3,4},{2,4,3},{3,4,5}};
    //creating another matrix to store transpose of a matrix
    int transpose[][]=new int[3][3]; //3 rows and 3 columns
    //Code to transpose a matrix
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            transpose[i][j]=original[j][i];
        }
        System.out.println("Printing Matrix without transpose:");
        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                System.out.print(original[i][j]+" ");
            }
            System.out.println();//new line
        }
        System.out.println("Printing Matrix After Transpose:");
        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                System.out.print(transpose[i][j]+" ");
            }
            System.out.println();//new line
        }
    }
}
```

Test it Now

Output

```
Printing Matrix without transpose:
```

```
1 3 4
```

```
2 4 3
```

```
3 4 5
```

```
Printing Matrix After Transpose:
```

```
1 2 3
```

```
3 4 4
```

```
4 3 5
```

11. Write a java program that computes the area of a circle, rectangle and a Cylinder using function overloading.

Ans :

```
class OverloadDemo
{
    void area(float x)
    {
        System.out.println("the area of the square is "+Math.pow(x, 2)+" sq units");
    }
    void area(float x, float y)
    {
        System.out.println("the area of the rectangle is "+x*y+" sq units");
    }
    void area(double x)
    {
        double z = 3.14 * x * x;
        System.out.println("the area of the circle is "+z+" sq units");
    }
}

class Overload
{
    public static void main(String args[])
    {
        OverloadDemo ob = new OverloadDemo();
        ob.area(5);
        ob.area(11,12);
        ob.area(2.5);
    }
}
```

Output

```
javac OverloadDemo.java
java OverloadDemo
the area of the square is 25.0 sq units
the area of the rectangle is 132.0 sq units
the area of the circle is 19.625 sq units
```

12. Write a Java program for the implementation of multiple inheritance using interfaces to calculate the area of a rectangle and triangle.

Ans :

For answer refer to Unit-II, Q.No. 21 (Multiple Inheritance)

13. Write a java program to create a frame window in an Applet.

Ans :

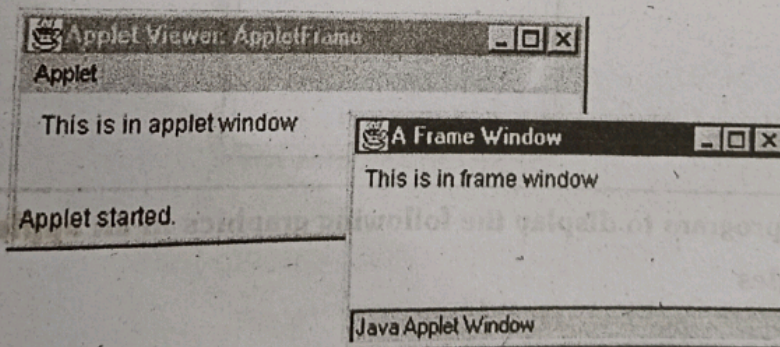
```
// Create a child frame window from within an applet.
import java.awt.*;
import java.awt.event.*;
import java.applet.*;
/*
    <applet code="AppletFrame" width=400 height=60>
    </applet>
*/
// Create a subclass of Frame.
class SampleFrame extends Frame {
    SampleFrame(String title) {
        super(title);
    }
    // create an object to handle window events
    MyWindowAdapter adapter = new MyWindowAdapter(this);
    // register it to receive those events
    addWindowListener(adapter);
}
public void paint(Graphics g) {
    g.drawString("This is in frame window", 10, 40);
}
}
class MyWindowAdapter extends WindowAdapter
{
    SampleFrame sampleFrame;
    public MyWindowAdapter(SampleFrame sampleFrame)
    {
        this.sampleFrame = sampleFrame;
    }
}
```

```

public void windowClosing(WindowEvent we) {
    sampleFrame.setVisible(false);
}
}
// Create frame window.
public class AppletFrame extends Applet {
    Frame f;
    public void init() {
        f = new SampleFrame("A Frame Window");
        f.setSize(150, 150);
        f.setVisible(true);
    }
    public void start() {
        f.setVisible(true);
    }
    public void stop() {
        f.setVisible(false);
    }
    public void paint(Graphics g) {
        g.drawString("This is in applet window", 15, 30);
    }
}

```

OUTPUT



14. Write a java program to draw a line between two coordinates in a window.

Ans :

```

import java.applet.Applet;
import java.awt.Graphics;
public class DrawLineExample extends Applet
{
    public void paint(Graphics g)
    {

```

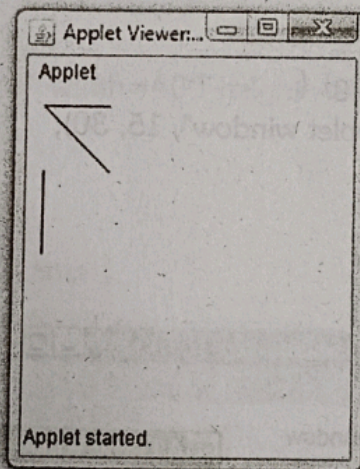
/*

```

* to draw line in an applet window use,
* void drawLine(int x1,int y1, int x2, int y2)
* method.
*
* This method draws a line between (x1,y1) and (x2,y2)
* coordinates in a current color.
*/
//this will draw a line between (10,10) and (50,50) coordinates.
g.drawLine(10,10,50,50);
//draw vertical line
g.drawLine(10,50,10,100);
//draw horizontal line
g.drawLine(10,10,50,10);
}
}

```

Example Output



15. Write a java program to display the following graphics in an applet window.

- (a) Rectangles
- (b) Circles
- (c) Ellipses
- (d) Arcs
- (e) Polygons

Ans :

```
import java.applet. Applet;
```

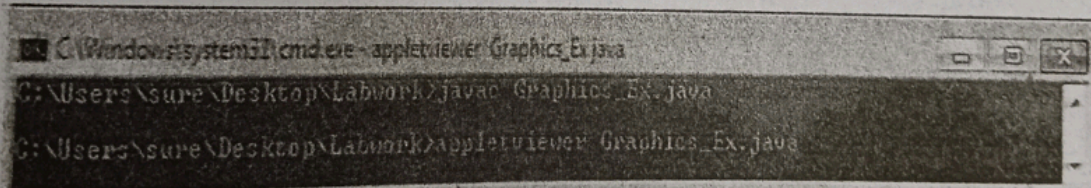
```
import java.awt.Graphics;
```

```
/*
```

```
<applet code="Graphics_Ex" width=400 height=400>
```

```
</applet>
*/
import java.awt.*;
import java.applet.*;
public class GraphicsEx extends Applet
{
    public void paint(Graphics g)
    {
        g.setFont(new Font("Cambria", Font.BOLD,15));
        g.drawString("Drawing different shapes in Applet window", 15, 15);
        g.drawRect( 10,20,60,40); //drawing rectangle
        g.drawOval(70, 70, 70, 70); //drawing circle
        g.drawOval(120, 160, 100, 50); //drawing ellipse
        g.drawArc(60, 125, 80, 40, 180,180); //drawing arc
        int x[] = { 210,230, 240, 250, 310, 340 };
        int y[] = { 310, 340, 150, 140, 130, 110 };
        int n = 6;
        Polygon pg = new Polygon(x, y, n);
        g.drawPolygon(pg); //drawing polygon
    }
}
```

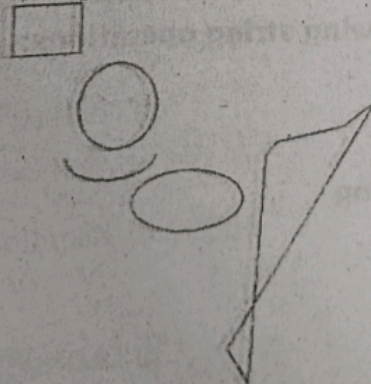
Output:



```
C:\Windows\system32\cmd.exe - appletviewer GraphicsEx.java
C:\Users\sure\Desktop\Labwork> javac GraphicsEx.java
C:\Users\sure\Desktop\Labwork> appletviewer GraphicsEx.java
```

Applet Viewer: GraphicsEx

Applet: Drawing different shapes in Applet window



16. Write a program that reads two integer numbers for the variables a and b. If any other character except number (0-9) is entered then the error is caught by NumberFormatException object. After that ex.getMessage () prints the information about the error occurring causes.

Ans :

```
import java.io.*;
public class exceptionHandle
{
    public static void main(String[] args) throws Exception{
        try
        {
            int a, b;
            BufferedReader in =
            new BufferedReader(new InputStreamReader(System.in));
            a = Integer.parseInt(in.readLine());
            b = Integer.parseInt(in.readLine());
        }
        catch (NumberFormatException ex){
            System.out.println(ex.getMessage() + " is not a numeric value.");
            System.exit(0);
        }
    }
}
```

Output

```
C:\winod\xml>javac exceptionHandle.java
```

```
C:\winod\xml>java exceptionHandle
```

```
For input string: "" is not a numeric value.
```

17. Write a program for the following string operations:

- Compare two strings
- Concatenate two strings
- Compute length of a string

Ans :

```
import java.io.*;
import java.util.*;
class StringOperations
{
```



```

public static void main (String[] args)
{
    boolean flag;
    String str1 = "Hello";
    String str2 = "World";
    //String Concatenation
    System.out.println("The concatenated string is: " + str1.concat(str2));
    //String Comparison
    flag = str1.equals(str2);
    System.out.println("str1 is equal to str2: "+flag);
    //String Length
    System.out.println("The length of str1 is: " + str1.length());
    System.out.println("The length of str2 is: " + str2.length());
}
}

```

Output

```

C:\Users\sure\Desktop\Labwork> java StringOperations.java
The concatenated string is: HelloWorld
str1 is equal to str2: false
The length of str1 is: 5
The length of str2 is: 5
C:\Users\sure\Desktop\Labwork>

```

18. Create a class called Fraction that can be used to represent the ratio of two integers. Include appropriate constructors and methods. If the denominator becomes zero, throw and handle an exception.

Ans :

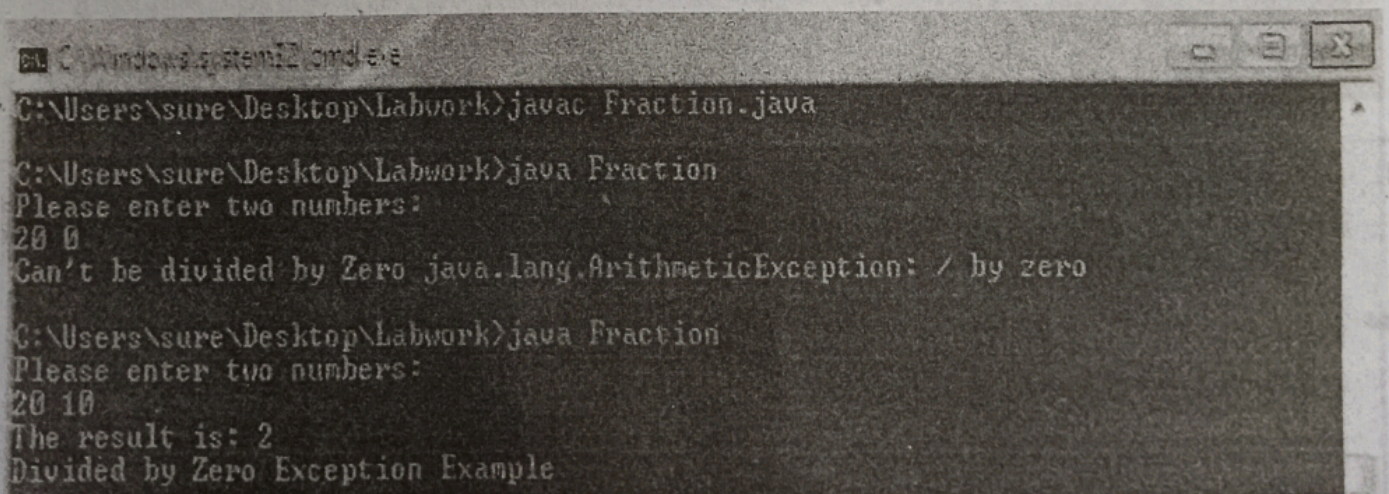
```

import java.util.Scanner; class Fraction
{
    public Fraction() throws ArithmeticException
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("Please enter two numbers: ");
        int numerator = sc.nextInt();
    }
}

```

```
int denominator = sc.nextInt();
int result = numerator/denominator;
System.out.println("The result is: " + result);
}
void display()
{
System.out.println("Divided by Zero Exception Example");
}
public static void main(String args[])
{
try
{
Fraction f = new Fraction(); f.display();
}
catch(ArithmeticException e)
{
System.out.println ("Can't be divided by Zero " + e);
}
}
}
```

Output



```
C:\Windows\system32\cmd.exe
C:\Users\sure\Desktop\Labwork>javac Fraction.java
C:\Users\sure\Desktop\Labwork>java Fraction
Please enter two numbers:
20 0
Can't be divided by Zero java.lang.ArithmeticException: / by zero

C:\Users\sure\Desktop\Labwork>java Fraction
Please enter two numbers:
20 10
The result is: 2
Divided by Zero Exception Example
```