// 1.Write a program that demonstrates program structure of java with use of arithmetical and logical implementation.

```java
class JavaStruc
{
public static void main(String[] args)
{
int a=10,b=5;
System.out.println("Addition Is : "+(a+b));
System.out.println("Substraction Is : "+(a-b));
System.out.println("Multiplicaton Is : "+(a*b));
System.out.println("Divison Is : "+(a/b));
System .out.println("Modulo Is : "+(a%b));
boolean x=true,y=false;
System.out.println("AND (x&&y) : "+(x&&y));
System.out.println("OR (x||y) : "+(x||y));
System.out.println("Not (!x) : "+(!x));
}
}

/*
Output
Addition Is : 15
Substraction Is : 5
Multiplicaton Is : 50
Divison Is : 2
Modulo Is : 0
AND (x&&y) : false
OR (x||y) : true
Not (!x) : false

Tool completed successfully */
```

// 2. Write a program that demonstrates string operations using String and StringBuffer class.

```java
class StringsOP
{
public static void main(String[] args)
{
StringBuffer s=new StringBuffer("Hello");
StringBuffer s1=new StringBuffer("Java Programmers");
String s2=s+" "+s1;
System.out.println("Concatenated String Is : "+s2);
System.out.println("Substring of Character 6 to 18 String Is : "+s2.substring(6,18));
System.out.println("Length Of String Is : "+s2.length());
System.out.println("Character At Index 3 Is : "+s2.charAt(3));
}
}

/*
Output
Concatenated String Is : Hello Java Programmers
Substring of Character 6 to 18 String Is : Java Program
Length Of String Is : 22
Character At Index 3 Is : l  */
```

// 3. Write a program to demonstrate inner class and static fields.

```java
class Outer
{
static int count=0;
public Outer()
{
count++;
}
class Inner
{
void display()
{
System.out.println("This Is Inner Class");
}
}
public static void main(String[] args)
{
Outer obj1=new Outer();
Outer obj2=new Outer();
Outer.Inner obj3=obj1.new Inner();
obj3.display();
System.out.println("No. Of Outer Class Objects Created : "+Outer.count);
}
}

/*
Output
This Is Inner Class
No. Of Outer Class Objects Created : 2

Tool completed successfully */
```

// 4. Write a program that demonstrates inheritance, polymorphism.

```java
class Animal
{
void Sound()
{
System.out.println("Animal Makes A Sound");
}
}
class Dog extends Animal
{
void Sound()
{
System.out.println("Dog Barks ");
}
}
class Cat extends Animal
{
void Sound()
{
System.out.println("Cat Meows ");
}
}
class IPExam
{
public static void main(String[] args)
{
Animal A=new Animal();
Animal B=new Dog();
Animal C=new Cat();
A.Sound();
B.Sound();
C.Sound();
}
}

/*
Output
Animal Makes A Sound
Dog Barks
Cat Meows

Tool completed successfully  /*
```
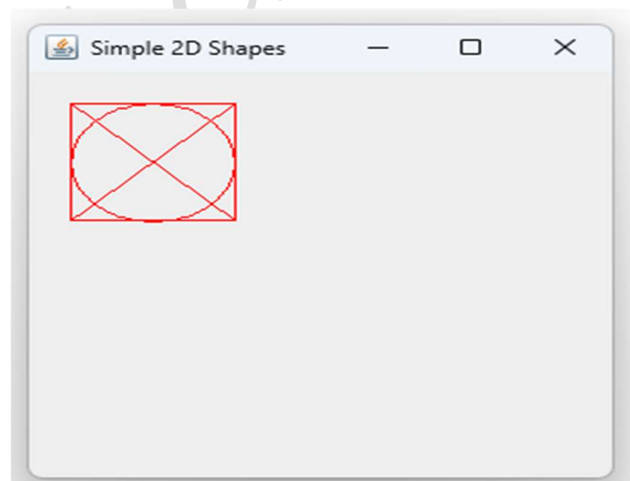
// 5. Write a program that demonstrates 2D shapes on frames.

```java
import javax.swing.*;
import java.awt.*;
class shapes extends JPanel
{
public void paint(Graphics g)
{
g.setColor(Color.RED);
g.drawRect(20,20,80,75);
g.drawLine(20,20,100,95);
g.drawLine(100,20,20,95);
g.drawOval(20,20,80,76);
}
public static void main(String[] args)
{
JFrame F=new JFrame();
F.setTitle("Simple 2D Shapes");
F.setSize(300,300);
F.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
F.add(new shapes());
F.setVisible(true);
}
}

/*
Output
```

// 6. Write a program that demonstrates color and fonts.

```java
import javax.swing.*;
import java.awt.*;
class CFDemo extends JPanel
{
public void paint(Graphics g)
{
g.setFont(new Font("Serif",Font.BOLD,24));
g.setColor(Color.RED);
g.drawString("This Is RED Colour",50,50);
g.setColor(Color.YELLOW);
g.drawString("This Is YELLOW Colour",50,80);
g.setColor(Color.ORANGE);
g.drawString("This Is ORANGE Colour",50,110);
g.setColor(Color.BLACK);
g.drawString("This Is BLACK Colour",50,140);
}
public static void main(String[] args)
{
JFrame J=new JFrame();
J.setTitle("Colour And Font Demo");
J.setSize(300,300);
J.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
J.add(new CFDemo());
J.setVisible(true);
}
}

/*
Output
```
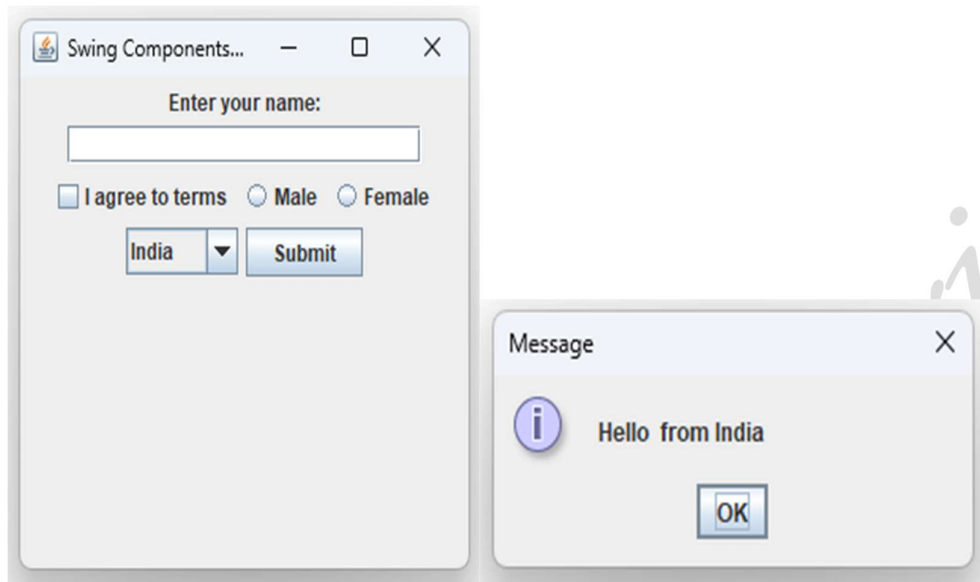
```java
// 7. Write a program to illustrate the use of various swing components.

import javax.swing.*;
import java.awt.*;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
public class SwingComponentsDemo extends JFrame
{
public SwingComponentsDemo()
{
setTitle("Swing Components Example");
setSize(300,300);
setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
setLayout(new FlowLayout());
JLabel label = new JLabel("Enter your name:");
add(label);
JTextField textField = new JTextField(20);
add(textField);
JCheckBox checkBox = new JCheckBox("I agree to terms");
add(checkBox);
JRadioButton maleButton = new JRadioButton("Male");
JRadioButton femaleButton = new JRadioButton("Female");
ButtonGroup genderGroup = new ButtonGroup();
genderGroup.add(maleButton);
genderGroup.add(femaleButton);
add(maleButton);
add(femaleButton);
String[] countries = {"India", "USA", "UK", "Canada"};
JComboBox<String> comboBox = new JComboBox<>(countries);
add(comboBox);
JButton button = new JButton("Submit");
add(button);
button.addActionListener(new ActionListener()
{
public void actionPerformed(ActionEvent e)
{
String name = textField.getText();
String country = (String) comboBox.getSelectedItem();
JOptionPane.showMessageDialog(null, "Hello " + name + " from " + country);
}
});
setVisible(true);
}
public static void main(String[] args)
{
new SwingComponentsDemo();
```

```
}
}
```

/*
Output

```java
// 8. Write a program that demonstrates use of dialog box and menus.

import javax.swing.*;
import java.awt.*;
import java.awt.event.*;
class MenuFrame extends JFrame
{
public MenuFrame()
{
setTitle("Menu Demo");
setSize(500,400);
}
}
public class menu
{
public static void main(String args[])
{
MenuFrame frame=new MenuFrame();
JMenuBar mb=new JMenuBar();
frame.setJMenuBar(mb);
JMenu fileMenu=new JMenu("File");
JMenuItem newItem=new JMenuItem("New");
JMenuItem openItem=new JMenuItem("Open");
JMenuItem saveItem=new JMenuItem("Save");
fileMenu.add(newItem);
fileMenu.add(openItem);
fileMenu.add(saveItem);
fileMenu.addSeparator();
JMenu editMenu=new JMenu("Edit");
JMenuItem cutItem=new JMenuItem("Cut");
JMenuItem copyItem=new JMenuItem("Copy");
JMenuItem pasteItem=new JMenuItem("Paste");
editMenu.add(cutItem);
editMenu.add(copyItem);
editMenu.add(pasteItem);
mb.add(fileMenu);
mb.add(editMenu);
frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
frame.setVisible(true);
}
}
```

/*

Output

// 9. Write a program that demonstrates event handling for various types of events.

```java
//Program to Demonstrate Window Events.
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
class WindowFrame extends JFrame implements WindowListener
{
public WindowFrame()
{
setTitle("Window Test");
setSize(300,200);
addWindowListener(this);
}
public void windowClosing(WindowEvent e)
{
System.out.println("Window is closing");
}
public void windowOpened (WindowEvent e)
{
System.out.println("Window is opened");
}
public void windowIconified (WindowEvent e)
{
System.out.println("Window is iconified");
}
public void windowDeiconified(WindowEvent e)
{
System.out.println("Window is deiconified");
}
public void windowClosed(WindowEvent e)
{
System.out.println("Window is closed");
}
public void windowActivated(WindowEvent e)
{
System.out.println("Window id activated");
}
public void windowDeactivated(WindowEvent e)
{
System.out.println("Window is deactivated");
}
}
public class window
{
public static void main(String args[])
```

```
{
WindowFrame f=new WindowFrame();
f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
f.setVisible(true);
}
}
/*
```

Output
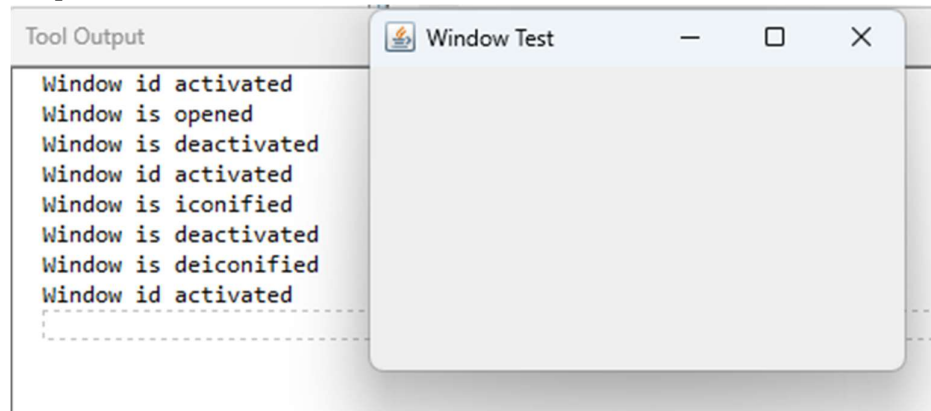
```java
//Program to Demonstrate Keyboard Events.
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
class KeyFrame extends JFrame implements KeyListener
{
public KeyFrame(){
setTitle("Sketch Frame");
setSize(300,350);
addKeyListener(this);
}
public void keyPressed(KeyEvent evt)
{
System.out.println("Key Pressed by user");
}
public void keyReleased(KeyEvent evt)
{
System.out.println("Key Released by user");
}
public void keyTyped(KeyEvent evt)
{
System.out.println("Key typed by user");
}
}
public class key
{
public static void main(String[]args)
{
JFrame frame=new KeyFrame();
frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
frame.setVisible(true);
}
}

/*
Output
```
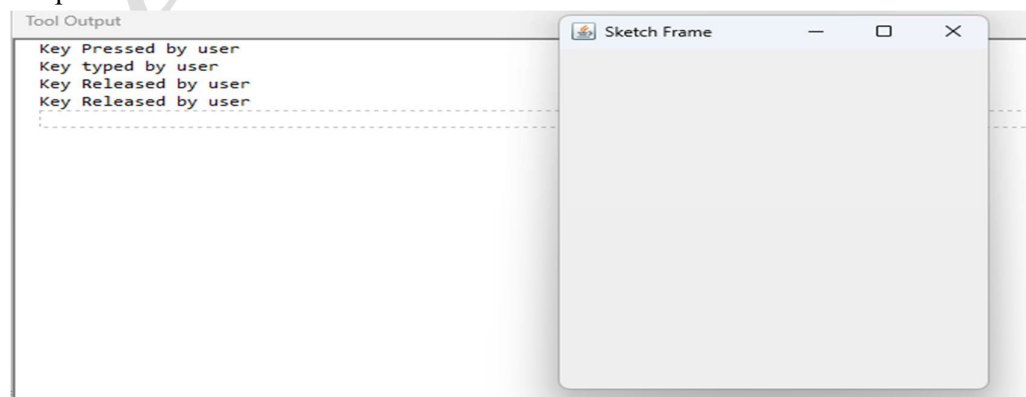
```java
//Program in Java to Demonstrate Mouse Events.
import java.awt.*;
import java.awt.event.*;
public class mouse extends Frame implements MouseListener
{
Label l;
mouse()
{
addMouseListener(this);
l=new Label();
l.setBounds(20,50,100,20);
add(l);
setTitle("Mouse event");
setSize(300,300);
setLayout(null);
setVisible(true);
}
public void mouseClicked(MouseEvent e)
{
System.out.println("Mouse Clicked");
}
public void mouseEntered(MouseEvent e)
{
System.out.println("Mouse Entered");
}
public void mouseExited (MouseEvent e)
{
System.out.println("Mouse Exited");
}
public void mousePressed (MouseEvent e)
{
System.out.println("Mouse Pressed");
}
public void mouseReleased(MouseEvent e)
{
System.out.println("Mouse Released");
}
public static void main(String[] args)
{
new mouse();
}
}
```

/*
Output

Tool Output

Mouse event

```
Mouse Entered
Mouse Exited
Mouse Entered
Mouse Exited
Mouse Entered
Mouse Exited
Mouse Entered
Mouse Pressed
Mouse Released
Mouse Clicked
Mouse Pressed
Mouse Released
Mouse Clicked
Mouse Exited
Mouse Entered
Mouse Exited
Mouse Entered
Mouse Exited
```
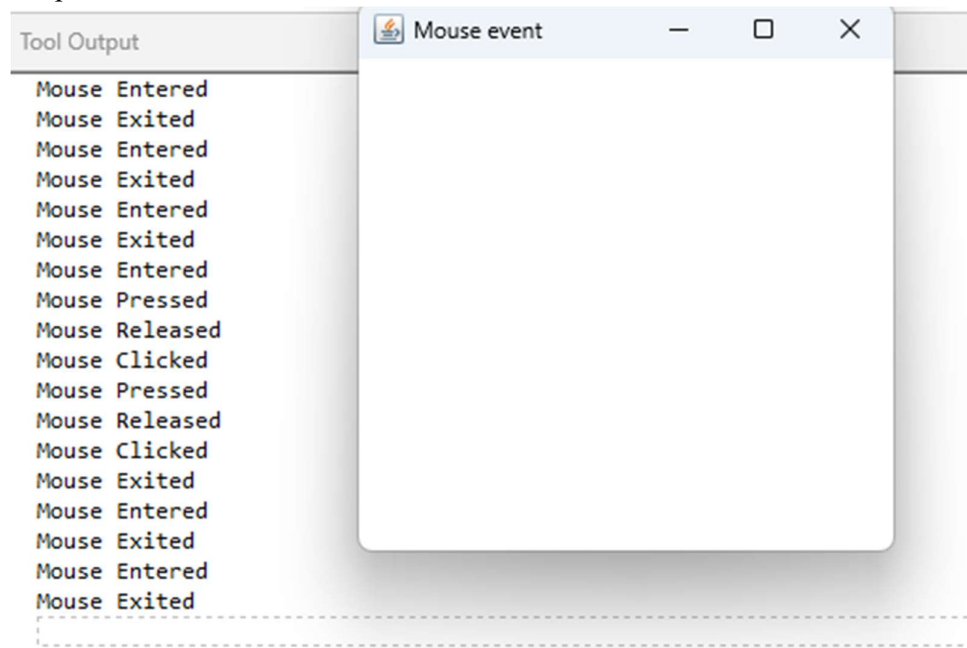
```java
// 10. Write a program to illustrate multithreading.

class DemoThread extends Thread
{
public void run()
{
for (int i=1;i<=100;i++)
{
System.out.print(i+"\t");
}
}
public static void main(String[] args)
{
DemoThread D=new DemoThread();
Thread T=new Thread(D);
DemoThread D1=new DemoThread();
Thread T1=new Thread(D1);
T.start();
T1.start();
}
}

/*
Output
1       2       3       4       5       6       7       8       9       10      11      12      13
        14      15      16      17      18      19      20      21      22      23      24      25
        26      27      28      29      30      31      32      33      34      35      36      37
        38      39      40      41      42      43      44      45      46      47      48      49
        50      51      52      53      54      55      56      57      58      59      60      61
        62      63      64      65      66      67      68      69      70      71      72      73
        74      75      76      77      78      79      80      81      82      83      84      85
        86      87      88      89      90      91      92      93      94      95      96      97
        98      99      100     1       2       3       4       5       6       7       8       9
        10      11      12      13      14      15      16      17      18      19      20      21
        22      23      24      25      26      27      28      29      30      31      32      33
        34      35      36      37      38      39      40      41      42      43      44      45
        46      47      48      49      50      51      52      53      54      55      56      57
        58      59      60      61      62      63      64      65      66      67      68      69
        70      71      72      73      74      75      76      77      78      79      80      81
        82      83      84      85      86      87      88      89      90      91      92      93
        94      95      96      97      98      99      100
Tool completed successfully  */
```
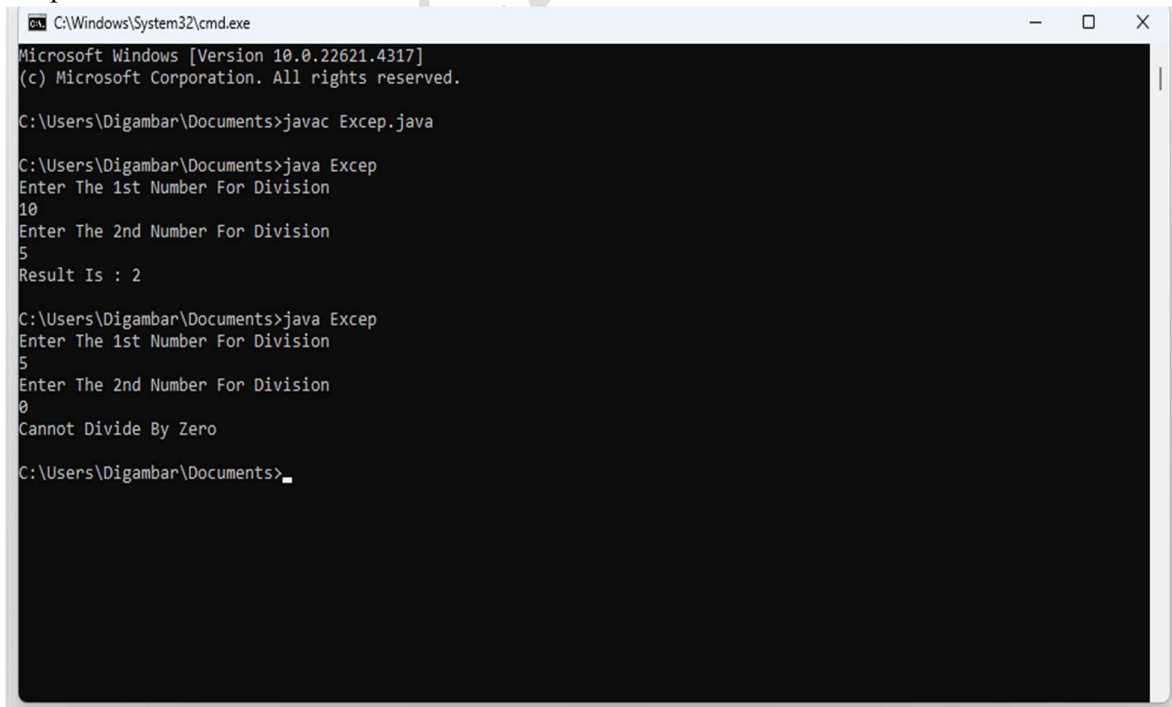
// 11.Write a program to illustrate exception handling.

```java
import java.util.*;
class Excep extends Exception
{
public static void main(String[] args)
{
Scanner s=new Scanner(System.in);
System.out.println("Enter The 1st Number For Division");
int a=s.nextInt();
System.out.println("Enter The 2nd Number For Division");
int b=s.nextInt();
try
{
int c=a/b;
System.out.println("Result Is : "+c);
}
catch(Exception e)
{
System.out.println("Cannot Divide By Zero");
}
}
}

/*
Output
```

// 12.Write a program to demonstrate the use of File class.

```java
import java.io.*;
class FileDemo
{
public static void main(String[] args) throws IOException
{
File file = new File("test.txt");
file.createNewFile();
FileWriter writer = new FileWriter(file);
writer.write("Hello, File Handling!");
writer.close();
BufferedReader reader = new BufferedReader(new FileReader(file));
System.out.println("File Content: " + reader.readLine());
reader.close();
file.delete();
}
}

/*
Output
File Content: Hello, File Handling!

Tool completed successfully */
```

// 13.Write a program that demonstrates JDBC on application.

// 14.Write a program that demonstrate package creation and use in program.

```java
package calculator;
public class Calculator
{
public int add(int a, int b)
{
return a+b;
}
public int subtract(int a, int b)
{
return a-b;
}
public int multiple(int a, int b)
{
return a*b;
}
public int divide(int a,int b)
{
return a/b;
}
}
```

```java
import calculator.Calculator;
public class arith
{
public static void main(String[] args)
{
Calculator cal = new Calculator();
int num1 = 10;
int num2 = 5;
System.out.println("Sum is: " + cal.add(p,q));
System.out.println("Subtraction is: " + cal.subtract(p,q));
System.out.println("Multiplication is: " + cal.multiply(p,q));
System.out.println("Division is: " + cal.divide(p,q));
}
}

/*
Output
Sum is: 15
Subtraction is: 5
Multiplication is: 50
Division is: 2

Tool completed successfully  */
```