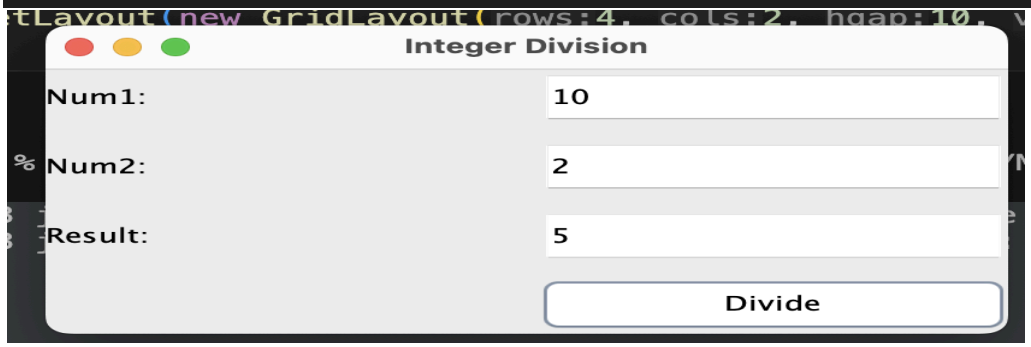
1. Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the

Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a
NumberFormatException. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.(Open ended program)

```
import javax.swing.*;
import java.awt.*;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;

public class IntegerDivisionApp {
   public static void main(String[] args) {
       JFrame frame = new JFrame("Integer Division");
       frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
       frame.setSize(400, 200);
       frame.setLayout(new GridLayout(4, 2, 10, 10));

       JLabel label1 = new JLabel("Num1:");
       JTextField textField1 = new JTextField();

       JLabel label2 = new JLabel("Num2:");
       JTextField textField2 = new JTextField();

       JLabel resultLabel = new JLabel("Result:");
       JTextField resultField = new JTextField();
       resultField.setEditable(false);

       JButton divideButton = new JButton("Divide");

       frame.add(label1);
       frame.add(textField1);
       frame.add(label2);
       frame.add(textField2);
       frame.add(resultLabel);
       frame.add(resultField);
       frame.add(new JLabel());
       frame.add(divideButton);
```

```
        divideButton.addActionListener(new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
                try {
                    int num1 = Integer.parseInt(textField1.getText());
                    int num2 = Integer.parseInt(textField2.getText());
                    int result = num1 / num2;
                    resultField.setText(String.valueOf(result));
                } catch (NumberFormatException ex) {
                    JOptionPane.showMessageDialog(frame, "Please enter valid
integers.", "Number Format Error", JOptionPane.ERROR_MESSAGE);
                } catch (ArithmeticException ex) {
                    JOptionPane.showMessageDialog(frame, "Cannot divide by zero.",
"Arithmetic Error", JOptionPane.ERROR_MESSAGE);
                }
            }
        });

        frame.setVisible(true);
    }
}
```



2. Demonstrate Inter process Communication and deadlock(both the programs attached)

```
public class DeadlockDemo {
    public static void main(String[] args) {
        final Object resource1 = "Resource1";
        final Object resource2 = "Resource2";

        Thread thread1 = new Thread(() -> {
            synchronized (resource1) {
```

```
                System.out.println("Thread1 locked Resource1");

                try {
                    Thread.sleep(100);
                } catch (InterruptedException e) {
                    e.printStackTrace();
                }

                synchronized (resource2) {
                    System.out.println("Thread1 locked Resource2");
                }
            }
        });

        Thread thread2 = new Thread(() -> {
            synchronized (resource2) {
                System.out.println("Thread2 locked Resource2");

                try {
                    Thread.sleep(100);
                } catch (InterruptedException e) {
                    e.printStackTrace();
                }

                synchronized (resource1) {
                    System.out.println("Thread2 locked Resource1");
                }
            }
        });

        thread1.start();
        thread2.start();
    }
}

Thread1 locked Resource1
Thread2 locked Resource2
```