1) Simple Interest Program (ActionEvent Example Too)
Answer:

```
import javax.swing.*;
import java.awt.*;
import java.awt.event.*;
public class SimpleInterest implements ActionListener {
   JFrame f;
   JLabel l1, l2, l3, l4;
   JTextField t1, t2, t3, t4;
   JButton b;
   SimpleInterest() {
      f = new JFrame();
      l1 = new JLabel("Amount");
      l1.setBounds(50, 50, 100, 20);
      t1 = new JTextField();
      t1.setBounds(120, 50, 100, 20);

      l2 = new JLabel("Rate");
      l2.setBounds(50, 80, 100, 20);
      t2 = new JTextField();
      t2.setBounds(120, 80, 100, 20);

      l3 = new JLabel("Time");
      l3.setBounds(50, 120, 100, 20);
      t3 = new JTextField();
      t3.setBounds(120, 120, 100, 20);

      l4 = new JLabel("Interest");
      l4.setBounds(50, 150, 100, 20);
      t4 = new JTextField();
      t4.setBounds(120, 150, 100, 20);

      b = new JButton("Find Interest");
      b.setBounds(50, 180, 150, 20);

      f.add(l1); f.add(t1); f.add(l2); f.add(t2); f.add(l3);
      f.add(t3); f.add(l4); f.add(t4); f.add(b);
      b.addActionListener(this);

      f.setTitle("Simple Interest Calculation");
      f.setSize(500, 500);
      f.setLayout(null);
      f.setVisible(true);
      f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
   }

   public void actionPerformed(ActionEvent e) {
      String s1 = t1.getText();
      String s2 = t2.getText();
      String s3 = t3.getText();

      int a = Integer.parseInt(s1);
      int b = Integer.parseInt(s2);
      int c = Integer.parseInt(s3);
      int d = (a * b * c) / 100;

      String result = String.valueOf(d);
      t4.setText(result);
   }

   public static void main(String args[]) {
      new SimpleInterest();
   }
}
```

2) Window Listener Example
Answer:

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

public class WindowExample implements WindowListener {
   WindowExample() {
      JFrame f = new JFrame();
      f.setTitle("MouseListener Example");
      f.addWindowListener(this);
      f.setSize(400, 400);
      f.setLayout(null);
      f.setVisible(true);
      f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
   }

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

   public void windowActivated(WindowEvent e) {
      System.out.println("Window Activated");
   }

   public void windowOpened(WindowEvent e) {
      System.out.println("Window Opened");
   }

   public void windowClosed(WindowEvent e) {
      System.out.println("Window Closed");
   }

   public void windowDeactivated(WindowEvent e) {
      System.out.println("Window Deactivated");
   }

   public void windowIconified(WindowEvent e) {
      System.out.println("Window Iconified");

   }

   public void windowClosing(WindowEvent e) {
      System.out.println("Window Closing");
   }

   public void windowDeiconified(WindowEvent e) {
      System.out.println("Window Deiconified");
   }
}
```

3) MouseEvent Example
Answer:

```
import javax.swing.*;

import java.awt.event.*;

public class MouseExample implements MouseListener {
   JLabel l;

   MouseExample() {
      JFrame f = new JFrame();
      l = new JLabel();
      l.setBounds(50, 100, 100, 20);
      f.add(l);
      f.setTitle("MouseListener Example");
      f.addMouseListener(this);
      f.setSize(400, 400);
      f.setLayout(null);
      f.setVisible(true);
      f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
   }

   public void mouseEntered(MouseEvent e) {
      l.setText("Mouse Entered");
   }

   public void mouseExited(MouseEvent e) {
      l.setText("Mouse Exited");
   }

   public void mouseClicked(MouseEvent e) {
      l.setText("Mouse clicked");
   }

   public void mousePressed(MouseEvent e) {
      l.setText("Mouse Pressed");
   }

   public void mouseReleased(MouseEvent e) {
      l.setText("Mouse Released");
   }

   public static void main(String args[]) {
      new MouseExample();
   }
}
```

4) FocusEvent Example
Answer:

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

public class FocusExample implements FocusListener {
   JFrame f;
   JButton b1, b2;

   FocusExample() {
      f = new JFrame();
      b1 = new JButton("First");
      b1.setBounds(50, 100, 100, 20);
      b2 = new JButton("Second");
      b2.setBounds(50, 130, 100, 20);

      f.add(b1);
      f.add(b2);
      b1.addFocusListener(this);
      b2.addFocusListener(this);

      f.setTitle("Focus Example");
      f.setSize(400, 400);
      f.setLayout(null);
      f.setVisible(true);
      f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
   }

   public void focusGained(FocusEvent e) {
      if (e.getSource() == b1) {
         System.out.println(b1.getLabel() + " Gained");
      }
```

```
    if (e.getSource() == b2) {
      System.out.println(b2.getLabel() + " Gained");
    }
  }

  public void focusLost(FocusEvent e) {
    if (e.getSource() == b1) {
      System.out.println(b1.getLabel() + " Lost");
    }

    if (e.getSource() == b2) {
      System.out.println(b2.getLabel() + " Lost");
    }
  }

  public static void main(String args[]) {
    new FocusExample();
  }
}
```

5) KeywordEvent Example
Answer:

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

public class KeywordExample implements KeyListener {
  JLabel l;

  KeywordExample() {
    JFrame f = new JFrame();
    l = new JLabel();
    l.setBounds(50, 100, 100, 20);
    f.add(l);
    f.setTitle("MouseListener Example");
    f.addKeyListener(this);
    f.setSize(400, 400);
    f.setLayout(null);
    f.setVisible(true);
    f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
  }

  public void keyPressed(KeyEvent e) {
    l.setText("KeyPressed");
  }

  public void keyTyped(KeyEvent e) {
    l.setText("KeyTyped");
  }

  public void keyReleased(KeyEvent e) {
    l.setText("KeyReleased");
  }

  public static void main(String args[]) {
    new KeywordExample();
  }
}
```

6) Area Calculation of Rectangle in java
Answer:

```
public class Area {
  double length, breadth;

  public static void main(String args[]) {
    Area a = new Area(2, 4);
    double cal = a.product();
    System.out.println("Area of rectangle is : " + cal);
  }

  Area(double l, double b) {
    length = l;
    breadth = b;
  }

  double product() {
    return length * breadth;
  }
}
```

7) Try, Catch , finally , throws Example (Keyword wala ja aayapani yei example lekni)
Answer:

```
public class Keywords {
  public static void main(String args[]) {
    int number = 13;
    try {
      System.out.println("Try-First Statement");
      myMethod(number);
      System.out.println("Try-Second Statement");
    } catch (Exception e) {
      System.out.println("An Exception Occur");
    } finally {
      System.out.println("Finally Statement Executed");
    }

    System.out.println("Statement not related to try,catch and finally");
  }

  public static void myMethod(int number) throws Exception {
    System.out.println("MyMethod First Statement");
    if (number == 12)
      throw new Exception();
    System.out.println("MyMethod Second Statement");
    return;
  }
}
```

8) File Read + Write Example (if both ask)
Answer:

```
//Write the simple java program that reads data from one file and writes data to another file.
import java.io.FileInputStream;
import java.io.FileOutputStream;

public class FileReadWrite {
  public static void main(String[] args) throws Exception

  {
    FileInputStream in = null;
    FileOutputStream out = null;
    in = new FileInputStream

    ("source_FileReadWrite.txt");

    out = new FileOutputStream

    ("destination_FileReadWrite.txt");

    int byteData;
    while (true) {
      byteData = in.read();
      if (byteData == -1) {
        break;
      }
      out.write(byteData);
    }
    if (in != null)
      in.close();
    if (out != null)
      out.close();
  }
}
```

9) JDBC Program Example
Answer:

```
import java.sql.Driver;
import java.sql.Connection;
import java.sql.Statement;
import java.sql.SQLException;
import java.sql.ResultSet;

public class DatabaseExample{
  public static void main(String args[]){
    try{
      Class.forName("com.mysql.jdbc.Driver");
      String url = "jdbc:mysql//localhost/test";
      Connection conn = DriverManager.getConnection(url);
      Statement st =  conn.createStatement();
      ResultSet rt =  st.executeQuery("SELECT * FROM Person");
      while(rt.next()){
        int id =  rt.getInt("P_Id");
        String name = rt.getString("P_Name");
        System.out.println(id+ "\t"+ name+ "\t");
      }
    }catch(SQLException e){
      System.out.println("Error: "+ e);
    }
  }
}
```

10) SendEmail Example using java
Answer:

```
//Write a program to send email using Java
import java.io.IOException;
import java.io.PrintWriter;
import java.net.InetAddress;
import java.net.Socket;
import java.util.*;

public class JavaEmail {
  public static void main(String[] args) throws IOException {
    Email email = new Email("ashok8786@gmail.com", "ashok9860@hotmail.com", "Test email.");
    email.send();
  }
}

class Email {
  private Scanner in = null;
  private PrintWriter out = null;
  private final String SMTP_SERVER = "smtp.wlink.com.np";
  private final int SMTP_PORT = 25;
  private String from = null;
  private String to = null;
  private String message = null;

  public Email(String from, String to, String message) {
    this.from = from;
    this.to = to;
    this.message = message;
  }

  private void send(String s) throws IOException {
```

```
    System.out.println(">> " + s);
    out.print(s.replaceAll("\n", "\r\n"));
    out.print("\r\n");
    out.flush();
  }

  private void receive() throws IOException {
    String line = in.nextLine();
    System.out.println(" " + line);
  }

  public void send() throws IOException {
    Socket socket = new Socket(SMTP_SERVER, SMTP_PORT);
    in = new Scanner(socket.getInputStream());
    out = new

    PrintWriter(socket.getOutputStream(), true);
    String hostName = InetAddress.getLocalHost()
        .getHostName();
    receive();
    send("HELO " + hostName);
    receive();
    send("MAIL FROM: <" + from + ">");
    receive();
    send("RCPT TO: <" + to + ">");
    receive();
    send("DATA");
    receive();
    send(message);
    send(".");
    receive();
    socket.close();
  }
}
```

11)A program showing “Kathamandu, Nepal” 10 times using JSP .
Answer:

```
<!-- Write a simple JSP program to display “Kathmandu, Nepal” 10 times. -->
<%--
  Document : Display10Times
  Created on : Jun 26, 2020, 9:13:20 AM
  Author : dipen
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
  <head>
    <meta http-equiv="Content-Type" content="text/html;charset=UTF-8">
    <title>Display Address 10 Times</title>
  </head>
  <body>
    <%
      for(int i = 1; i<=10; i++)
      {
        out.println("Kathmandu,Nepal<br>");
      }
    %>
  </body>
</html>
```

12) An array is called balanced if it’s even numbered elements (a[0], a[2], etc.) are even and its odd numbered elements (a[1], a[3], etc.) are odd. Write a function named balanced that accepts an array of integers which returns 1 if the array is balanced and returns 0 otherwise.
Answer:

```
public class ArrayQuestion {
  static int[] array = { 6, 4, 2, 3, 12 };

  public static void main(String[] arr) {
    System.out.println(isBalanced(array));
  }

  public static int isBalanced(int[] a) {
    int count = 1;
    for (int i = 0; i < array.length; i += 2) {
      if (a[i] % 2 != 0) {
        count = 0;
        break;
      }
    }
    for (int j = 1; j < array.length; j += 2) {
      if (a[j] % 2 == 0) {
        count = 0;
        break;
      }
    }
    return count;
  }
}
```

13) MouseAdapter Example (Adapter Class Example).
Answer:

```
import java.awt.event.*;

import javax.swing.JFrame;
import javax.swing.JLabel;

public class MouseAdapterExample extends MouseAdapter {
  JFrame f;
  JLabel l;

  MouseAdapterExample() {
    f = new JFrame();
    l = new JLabel();
    l.setBounds(50, 50, 100, 20);
    f.add(l);
    f.addMouseListener(this);
    f.setTitle("Mouse Adapter Example");
    f.setSize(400, 400);
    f.setLayout(null);
    f.setVisible(true);
    f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
  }

  public void mouseClicked(MouseEvent e) {
    l.setText("Mouse clicked");
  }

  public static void main(String args[]) {
    new MouseAdapterExample();
  }
}
```

14) GridLayout Example
Answer:

```
import javax.swing.*;
import java.awt.*;

public class GridLayoutExample {
  JFrame f;
  JButton b1, b2, b3, b4;

  GridLayoutExample() {
    f = new JFrame();
    b1 = new JButton("1");
    b2 = new JButton("2");
    b3 = new JButton("3");
    b4 = new JButton("4");

    f.add(b1);
    f.add(b2);
    f.add(b3);
    f.add(b4);

    f.setTitle("GridLayout Example");
    f.setLayout(new GridLayout(2, 2));
    f.setSize(300, 300);
    f.setVisible(true);
    f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
  }

  public static void main(String args[]) {
    new GridLayoutExample();
  }
}
```

15) GroupLayout Example
Answer:

```
import javax.swing.*;
import java.awt.*;

public class GroupLayoutExample {
  GroupLayoutExample() {
    JFrame f = new JFrame();
    JLabel label = new JLabel("Click Here");
    JButton button = new JButton("This Button");
    Container contentPanel = f.getContentPane();
    GroupLayout groupLayout = new GroupLayout(contentPanel);
    contentPanel.setLayout(groupLayout);

    groupLayout.setHorizontalGroup(
        groupLayout.createSequentialGroup()
            .addComponent(label)
            .addGap(10, 20, 100)
            .addComponent(button));

    groupLayout.setVerticalGroup(
        groupLayout.createParallelGroup(GroupLayout.Alignment.BASELINE)
            .addComponent(label)
            .addComponent(button));
    f.setTitle("GroupLayout Example");
    f.pack();
    f.setVisible(true);
    f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
  }

  public static void main(String args[]) {
    new GroupLayoutExample();
  }
}
```

16) Design a GUI form using swing with a text field, a text label for displaying the input message “Input any string”, and three buttons with caption “Check Palindrome”, “Reverse”, “Find Vowels”. Write a complete program for above scenario and for checking palindrome in first button, reverse it after clicking second button and extract the vowels from it after clicking third button.
Answer:

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

public class Checker implements ActionListener {
  JFrame f;
  JTextField t1, t2;
```

```
  JLabel l1, l2;
  JButton b1, b2, b3;

  Checker() {
    f = new JFrame();
    l1 = new JLabel("Enter Words");
    l1.setBounds(50, 50, 100, 20);
    t1 = new JTextField();
    t1.setBounds(130, 50, 300, 20);

    l2 = new JLabel("Result");
    l2.setBounds(50, 80, 100, 20);
    t2 = new JTextField();
    t2.setBounds(130, 80, 300, 20);

    b1 = new JButton("Palindrome");
    b1.setBounds(50, 120, 120, 20);
    b2 = new JButton("Find Vowels");
    b2.setBounds(50, 150, 120, 20);
    b3 = new JButton("Reverse");
    b3.setBounds(50, 180, 120, 20);

    f.add(l1);
    f.add(t1);
    f.add(l2);
    f.add(t2);
    f.add(b1);
    f.add(b2);
    f.add(b3);
    b1.addActionListener(this);
    b2.addActionListener(this);
    b3.addActionListener(this);
    f.setTitle("Checker");
    f.setSize(600, 400);
    f.setLayout(null);
    f.setVisible(true);
    f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
  }

  public void actionPerformed(ActionEvent e) {
    if (e.getSource() == b1) {
      String input = t1.getText();
      String text = "";
      int length = input.length();

      for (int i = length - 1; i >= 0; i--) {
        text += input.charAt(i);
      }
      if (text.equalsIgnoreCase(input)) {
        t2.setText("String is palindrome.");
      } else {
        t2.setText("String isn't a palindrome.");
      }
    } else if (e.getSource() == b2) {
      char[] vowel = { 'a', 'e', 'i', 'o', 'u', 'A', 'E', 'I', 'O', 'U' };
      String input = t1.getText();
      int length = input.length();
      char[] extractedVowel = new char[length];
      String showVowel = "";
      for (int i = 0; i <= length - 1; i++) {
        for (int j = 0; j <= vowel.length - 1; j++) {
          if (input.charAt(i) == vowel[j]) {
            extractedVowel[i] = input.charAt(i);
            showVowel += String.valueOf(extractedVowel[i]);
          }
        }
      }
      t2.setText("Vowels: " + showVowel);
    } else {
      String text = "";
      String input = t1.getText();
      int length = input.length();
      for (int i = length - 1; i >= 0; i--) {
        text += input.charAt(i);
      }
      t2.setText("Reverse String is: " + text);
    }
  }

  public static void main(String args[]) {
    new Checker();
  }
}
```

17) Write a simple Servlet program to display “Kathmandu, Nepal” 10 times.
Answer:

```
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
@WebServlet(urlPatterns ={"/Display10Times"})
public class Display10Times extends HttpServlet
{
 protected void doGet(HttpServletRequest request, HttpServletResponse response)
 throws ServletException, IOException
 {
 response.setContentType("text/html;charset=UTF-8");
 try (PrintWriter out = response.getWriter())
 {
        out.println("<!DOCTYPE html>");
        out.println("<html>");
        out.println("<head>");
        out.println("<title>Message</title>");
        for(int i = 1; i<=10; i++)
        {
                out.println("<h1>Kathmandu Nepal.</h1>");
        }
        out.println("</head>");
 }}
}
```

18) PreparedStatement Example.
Answer:

```
import java.sql.*;

public class GFG {

  // Driver Code
  public static void main(String[] args) throws Exception
  {

    // Register Driver Class
    Class.forName("org.apache.derby.jdbc.ClientDriver");

    // Connection to your database
    Connection con = DriverManager.getConnection();

    // Query which needs parameters
    String query
      = "Select * from students where age> ? and name = ?";

    // Prepare Statement
    PreparedStatement myStmt
      = con.prepareStatement(query);

    // Set Parameters
    myStmt.setInt(1, 20);
    myStmt.setStrin(2, 'Prateek');

    // Execute SQL query
    ResultSet myRs = myStmt.executeQuery();

    System.out.println('Age     Name');

    // Display function to show the Resultset
    while (myRs.next()) {
      String Name = rs.getString("name");
      int age = rs.getInt("age");
      System.out.println(Name + "     " + age);
    }

    // Close the connection
    con.close();
  }
}
```

19) Write a program to execute multiple threads in priority base.
Answer:

```
class First extends Thread {
  @Override
  public void run() {
    for (int i = 1; i <= 10; i++) {
      System.out.println(i);
    }
  }
}

class Second extends Thread {
  @Override
  public void run() {
    for (int i = 11; i <= 20; i++) {
      System.out.println(i);
    }
  }
}

class Third extends Thread {
  @Override
  public void run() {
    for (int i = 21; i <= 30; i++) {
      System.out.println(i);
    }
  }
}

public class ThreadPriority {
  public static void main(String[] args) throws InterruptedException {
    Thread t1 = new First();
    Thread t2 = new Second();
    Thread t3 = new Third();
    t1.setPriority(Thread.MAX_PRIORITY);
    t2.setPriority(Thread.MIN_PRIORITY);
    t3.setPriority(Thread.NORM_PRIORITY);
    t1.start();
    t2.start();
    t3.start();
  }
}
```

20) Write a Java program using JDBC to extract name of those students who live in Kathmandu district, assuming that the student table has four attributes (ID, name, district, and age).
Answer:

```
import java.sql.*;
```

```
public class StudentDatabase {
   public static void main(String[] args) throws SQLException {
      String url = "jdbc:mariadb://localhost:3306/JavaJDBC";
      String username = "root";
      String password = "";
      Connection connection = DriverManager.getConnection(url, username, password);
      Statement statement = connection.createStatement();
      String sql = "select * from students where district='kathmandu'";
      ResultSet resultSet = statement.executeQuery(sql);
      while (resultSet.next()) {
         System.out.printf("%d, %s, %s, %d \n", resultSet.getInt("id"), resultSet.getString("name"),
               resultSet.getString("district"), resultSet.getInt("age"));
      }
      statement.close();
      connection.close();
   }
}
```

21) Write a program to create a JSP web form to take input of a student and submit it to second JSP file which may simply print the values of form submission. [2075].
Answer:

```
// StudentForm.jsp
<%--
 Document : StudentForm
 Created on : Jun 26, 2020, 9:26:23 AM
 Author : dipen
--%>
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
 <head>
 <meta http-equiv="Content-Type" content="text/html;
charset=UTF-8">
 <title>Student Form.</title>
 </head>
 <body>
 <h1>Fill up the form!</h1>
 <form action="PrintDetail.jsp" method="POST">

 Name: <input type="text" name="name"><br><br>
 Roll No.: <input type="text" name="roll"><br><br>
 Address: <input type="text" name="address"><br><br>
 <input type="submit" value="Submit">
 </form>
 </body>
</html>

//PrintDetail.jsp
<%--
 Document : PrintDetail
 Created on : Jun 26, 2020, 9:33:47 AM
 Author : dipen
--%>
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
 <head>
 <meta http-equiv="Content-Type" content="text/html;
charset=UTF-8">
 <title>Print Student Details.</title>
 </head>
 <body>
 <h1>Student Details!</h1>
 Name: <%= request.getParameter("name") %><br>
 Roll No.: <%= request.getParameter("roll") %><br>
 Address: <%= request.getParameter("address") %><br>
 </body>
</html>
```

22) FileWriter Example (writing the data in the file testout.txt using Java FileWriter class.)
Answer:

```
package com.javatpoint;

import java.io.FileWriter;

public class FileWriterExample {
   public static void main(String args[]) {
      try {
         FileWriter fw = new FileWriter("D:\\testout.txt");
         fw.write("Welcome to javaTpoint.");
         fw.close();
      } catch (Exception e) {
         System.out.println(e);
      }
      System.out.println("Success...");
   }
}
```

23) FileReader Example (reading the data from the text file testout.txt using Java FileReader class).
Answer :

```
package com.javatpoint;

import java.io.FileReader;

public class FileReaderExample {
   public static void main(String args[]) throws Exception {
      FileReader fr = new FileReader("D:\\testout.txt");
      int i;
      while ((i = fr.read()) != -1)
         System.out.print((char) i);
      fr.close();
   }
}
```