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**1. WAP to sort the elements of an array in ascending order.**

class sort {

    static void merge(int a[], int l, int m, int r) {

        // get sizes of the arrays to merge

        int n1 = m - l + 1;

        int n2 = r - m;

        // creating temp array

        int L[] = new int[n1];

        int R[] = new int[n2];

        // coping elements in temp array

        for (int i = 0; i < n1; ++i) {

            L[i] = a[l + i];

        }

        for (int j = 0; j < n2; ++j) {

            R[j] = a[m + 1 + j];

        }

        // sorting and merging elements into main array

        int i = 0, j = 0;

        int k = l;

        while (i < n1 && j < n2) {

            if (L[i] <= R[j]) {

                a[k] = L[i];

                i++;

            } else {

                a[k] = R[j];

                j++;

            }

            k++;

        }

        // adding rest of the elements

        while (i < n1) {

            a[k] = L[i];

            i++;

            k++;

        }

        while (j < n2) {

            a[k] = R[j];

            j++;

            k++;

        }

    }

static void Mergesort(int[] a, int l, int r) {

        if (l < r) {

            int m = (l + (r - 1)) / 2;

            Mergesort(a, l, m);

            Mergesort(a, m + 1, r);

            merge(a, l, m, r);

        }

    }

    public static void main(String args[]) {

        int a[] = { 10, 9, 8, 7, 6, 5, 4, 3, 2, 1 };

        System.out.print("Elements before sorting => [");

        for (int e : a) {

            System.out.print(" " + e + " ");

        }

        System.out.print("]\n");

        Mergesort(a, 0, a.length - 1);

        System.out.print("Elements after sorting => [");

        for (int e : a) {

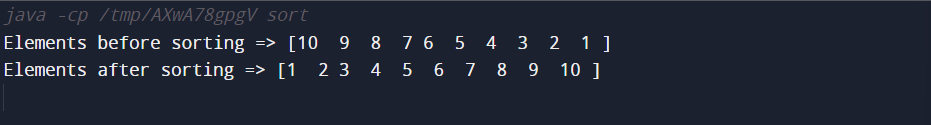
            System.out.print(" " + e + " ");

        }

        System.out.print("]\n");

    }

}

**1.Output:**

**2. WAP to find the transpose of a given matrix.**

class Trans {

    static void print(int[][] a) {

        for (int i = 0; i < 3; i++) {

            for (int j = 0; j < 3; j++) {

                System.out.print(a[i][j] + " ");

            }

            System.out.println("");

        }

    }

public static void main(String args[]) {

        int[][] a = { { 1, 2, 3 }, { 4, 5, 6 }, { 7, 8, 9 } };

        System.out.println("The matrix is: ");

        print(a);

        System.out.println("Transpose of the matrix is: ");

        int[][] c = new int[3][3];

        for (int i = 0; i < 3; i++) {

            for (int j = 0; j < 3; j++) {

                c[i][j] = a[j][i];

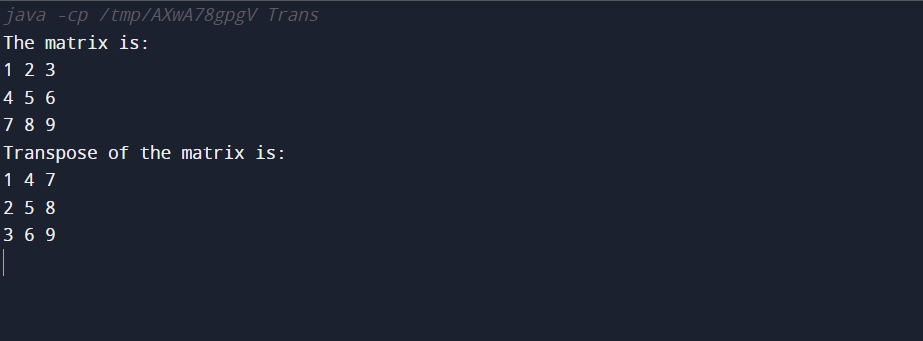
            }

        }

        print(c);

    }

}

**2.Output:**

**3. How to reverse a given String? (Without using a pre-defined function)**

class Reverse {

    public static void main(String args[]) {

        String s = "Vidya";

        String news = "";

        for (int i = s.length() - 1; i >= 0; i--) {

            news += s.charAt(i);

        }

        System.out.println(news);

    }

}

**3.Output:**



**4. WAP to How do you check if a given String is Palindrome or not**

import java.util.\*;

class Palindrome {

    public static void main(String args[]) {

        Scanner S = new Scanner(System.in);

        System.out.println("enter a string");

        StringBuilder s = new StringBuilder();

        s.append(S.next());

        StringBuilder r = new StringBuilder();

        r.append(s);

        r.reverse();

        System.out.println((s == r) ? "The String is palindrome" : "The string is not palindrome");

    }

}

**4.Output:**



**5. Create a package mca1 which will have 2 classes as class Mathematics with a method to add two numbers, add three float numbers and class Maximum with a method to find maximum of three numbers.**

//Mathematics.java

package mca1;

public class Mathematics {

    public int add(int a, int b) {

        return a + b;

    }

    public double add(double a, double b, double c) {

        return a + b + c;

    }

    public static void main(String args[]) {

        new Mathematics();

    }

}

//Maximum.java

package mca1;

public class Maximum {

    public void max(int a, int b, int c) {

        if (a >= b && a >= c) {

            System.out.println(a + " is the greatest number");

        } else if (b >= a && b >= c) {

            System.out.println(b + " is greatest among the three");

        } else {

            System.out.println(c + " is the greatest");

        }

    }

    public static void main(String args[]) {

        new Maximum();

    }

}

//main.java

import mca1.\*;

public class Package {

    public static void main(String args[]) {

        Mathematics m = new Mathematics();

        double c = m.add(11.1, 30.2, 30.3);

        System.out.println(m.add(10, 20));

        System.out.println(Math.floor(c));

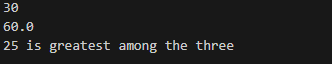
        Maximum M = new Maximum();

        M.max(10, 25, 5);

    }

}

**5.Output:**



**6. Write a Java program to create Animal interface that contains run() and eat() method. And implement methods in Dog and Cat class.**

interface Animal {

    void run();

    void eat();

}

class Dog implements Animal {

    public void eat() {

        System.out.println("The dog energy was called");

    }

    public void run() {

        System.out.println("The dog ran");

    }

}

class Cat implements Animal {

    public void eat() {

        System.out.println("The cat energy was called");

    }

    public void run() {

        System.out.println("The cat ran");

    }

}

class Dogs\_and\_Cats\_interface {

    public static void main(String args[]) {

        Dog d = new Dog();

        Cat c = new Cat();

        d.eat();

        d.run();

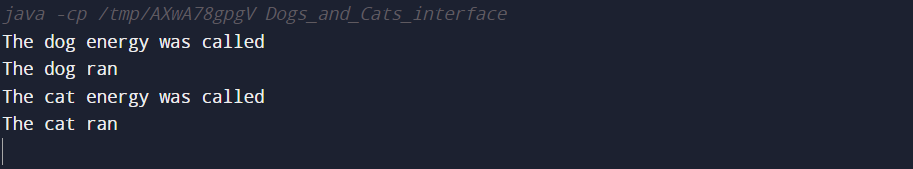
        c.eat();

        c.run();

    }

}

**6.Output:**



**7. Write a Java program to create an abstract class Animal that contains non abstract run() and abstract eat() method…Derive two classes Dog and Cat from it.**

abstract class Animal {

    void run() {

        System.out.println("Animal ran");

    };

    abstract void eat();

}

class Dog extends Animal {

public void eat() {

        System.out.println("The dog ate");

    }

    public void run() {

        System.out.println("The dog ran");

        super.run();

    }

}

class Cat extends Animal {

     void eat() {

        System.out.println("The cat ate");

    }

    public void run() {

        System.out.println("The cat ran");

        super.run();

    }

}

class Dogs\_and\_Cats\_abstract {

    public static void main(String args[]) {

        Dog d = new Dog();

        Cat c = new Cat();

        d.eat();

        d.run();

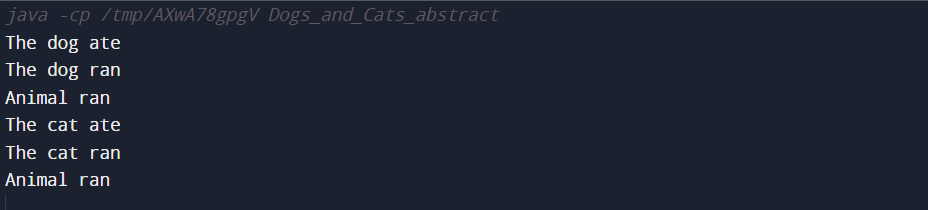
        c.eat();

        c.run();

    }

}

**7.Output:**



**8 Write a Java program to test any five of standard exception**

import java.util.\*;

class Test\_Exception {

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

        Scanner S = new Scanner(System.in);

        while (true) {

            System.out.println(

                    "1.ArrayIndexOutOfBounds Exception \n2. Arithmetic Exception\n3.ClassNotFound Exception\n4.NullPointer Exception\n5.StringOutOfBounds Exception\nEnter your choice: ");

            int x = S.nextInt();

            switch (x) {

                case 1:

                    try {

                        int a[] = { 1, 2, 3 };

                        System.out.println(a[4]);

                    } catch (Exception e) {

                        System.out.println("\n" + e + "\n");

                    }

                    break;

                case 2:

                    try {

                        int i = 10 / 0;

                        System.out.println(x);

                    } catch (Exception e) {

                        System.out.println("\n" + e + "\n");

                    }

                    break;

                case 3:

                    try {

                        Class.forName("Test");

                    } catch (Exception e) {

                        System.out.println("\n" + e + "\n");

                    }

                    break;

                case 4:

                    try {

                        String w = null;

                        System.out.println(w.charAt(0));

                    } catch (Exception e) {

                        System.out.println("\n" + e + "\n");

                    }

                    break;

                case 5:

                    try {

                        String c = "Ankesh";

                        System.out.println(c.charAt(10));

                    } catch (Exception e) {

                        System.out.println("\n" + e + "\n");

                    }

                    break;

                default:

                    System.out.println("Enter a valid choice.");

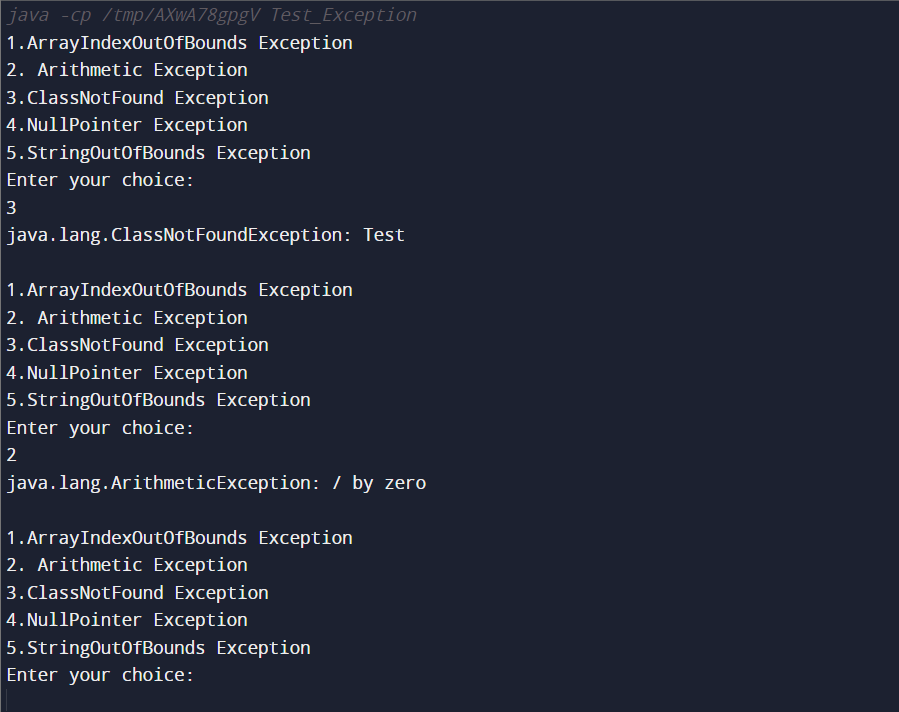
            }

        }

    }

}

**8.Output:**



**9 User-defined exception**

class UDE extends Exception {

}

class UserDefinedException {

    public static void main(String args[]) throws UDE {

        try {

            int a = 17;

            if (a < 18) {

                throw new UDE();

            } else {

                System.out.println("Age above 18");

            }

        } catch (Exception e) {

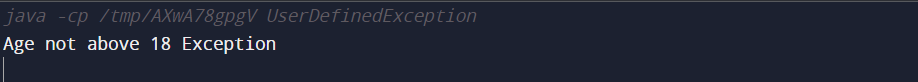
            System.out.println("Age not above 18 Exception");

        }

    }

}

**9.Output:**

****

**10 Write a Java program to create a Thread by extending the Thread class. And print the name of currently executing thread.**

class Thread\_demo {

    public static void main(String args[]) {

        newThread n = new newThread();

        System.out.println(Thread.currentThread().getName());

        n.start();

        System.out.println(Thread.currentThread().getName());

    }

}

class newThread extends Thread {

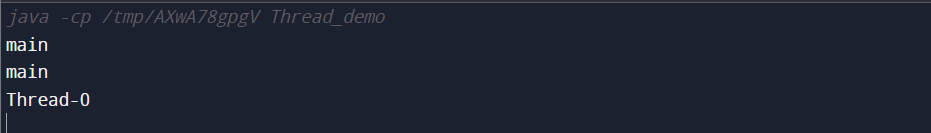
    public void run() {

        System.out.println(Thread.currentThread().getName());

    }

}

**10.Output:**

****

**11 Write a Java program to create a Thread by Implementing the Runnable Interface. And print the name of currently executing thread.**

class Thread\_runnable {

    public static void main(String args[]) {

        newThread n = new newThread();

        Thread th = new Thread(n);

        System.out.println(Thread.currentThread().getName());

        th.start();

        System.out.println(Thread.currentThread().getName());

    }

}

class newThread implements Runnable {

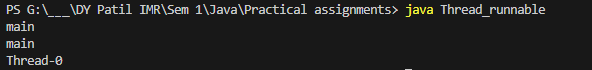
    public void run() {

        System.out.println(Thread.currentThread().getName());

    }

}

**Output:**



**12 Write a multithreaded program to print even and odd numbers. Create two threads, one thread prints even number and second thread prints odd number**

class even\_odd {

    public static void main(String args[]) {

        Even e = new Even();

        Odd o = new Odd();

        e.start();

        o.start();

    }

}

class Even extends Thread {

    public void run() {

        try {

            for (int i = 0; i < 21; i++) {

                if (i % 2 == 0) {

                    System.out.println(i);

                    sleep(1000);

                }

            }

        } catch (Exception e) {

            System.out.println(e);

        }

    }

}

class Odd extends Thread {

    public void run() {

        try {

            for (int i = 0; i < 21; i++) {

                if (i % 2 != 0) {

                    System.out.println(i);

                    sleep(1000);

                }

            }

        } catch (Exception e) {

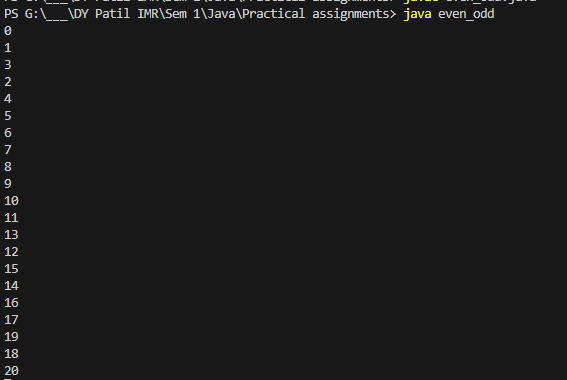
            System.out.println(e);

        }

    }

}

**12.Output:**

****

**13 Write a code to remove duplicates from Array List in Java.**

import java.util.\*;

class Remove\_dublicates {

    public static void main(String args[]) {

        ArrayList<Integer> a = new ArrayList<>();

        a.add(10);

        a.add(20);

        a.add(30);

        a.add(40);

        a.add(10);

        a.add(50);

        a.add(20);

        a.add(30);

        System.out.println("Original array list: " + a);

        LinkedHashSet<Integer> l = new LinkedHashSet<>();

        l.addAll(a);

        a.clear();

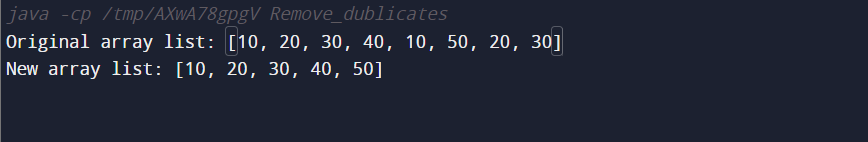
        a.addAll(l);

        System.out.println("New array list: " + a);

    }

}

**13.Output:**

****

**14 Write a code to sort a linked list and Reverse a linked list in java.**

import java.util.\*;

class Linked\_List {

    public static void main(String args[]) {

        LinkedList<Integer> l = new LinkedList<>();

        l.add(10);

        l.add(130);

        l.add(12);

        l.add(35);

        l.add(5);

        l.add(167);

        System.out.println("Unordered linked list=> " + l);

        TreeSet<Integer> t = new TreeSet<>();

        t.addAll(l);

        l.clear();

        l.addAll(t);

        System.out.println("Sorted Linked List => " + l);

        System.out.print("Linked List in reverse => [");

        for (int i = l.size() - 1; i >= 0; i--) {

            System.out.print(+l.get(i) + ", ");

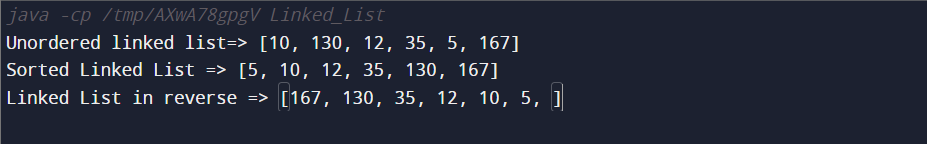
        }

        System.out.print("]");

    }

}

**14.Output:**

****

**15 Write a Java program to copy the contents of a file to another file.**

import java.io.\*;

import java.util.\*;

class File\_Handling {

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

        Scanner S = new Scanner(System.in);

        System.out.println("Enter File to be Read: ");

        String in = S.nextLine();

        File r = new File(in);

        System.out.println("Enter File to be Written: ");

        String out = S.nextLine();

        File w = new File(out);

        FileInputStream Read = new FileInputStream(r);

        FileOutputStream Write = new FileOutputStream(w);

        try {

            int n;

            while ((n = Read.read()) != -1) {

                Write.write(n);

            }

            System.out.println("File contents have been copied");

        } finally {

            S.close();

            Read.close();

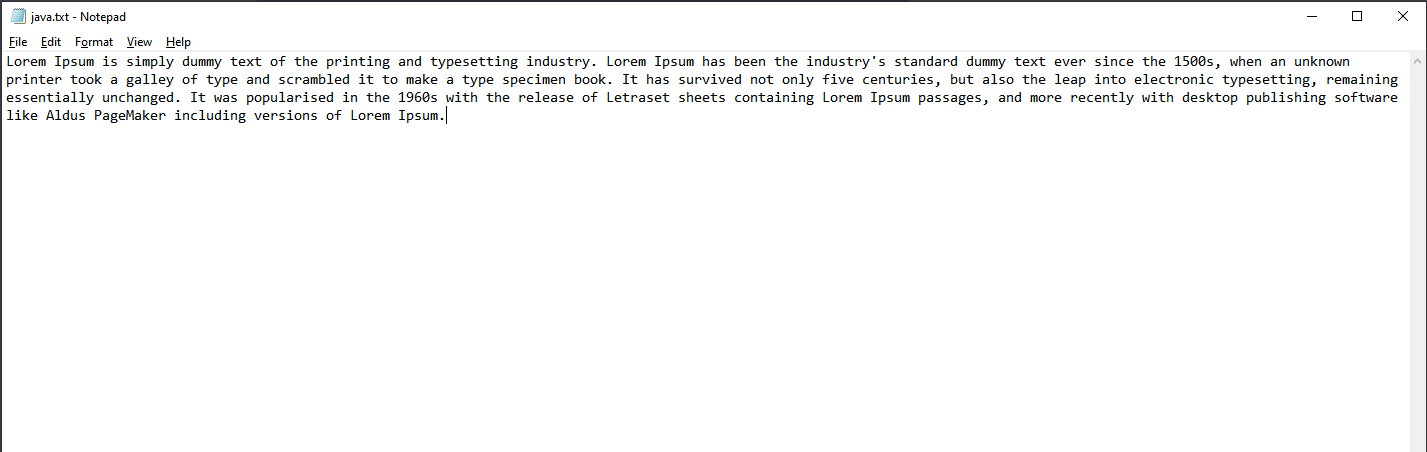
            Write.close();

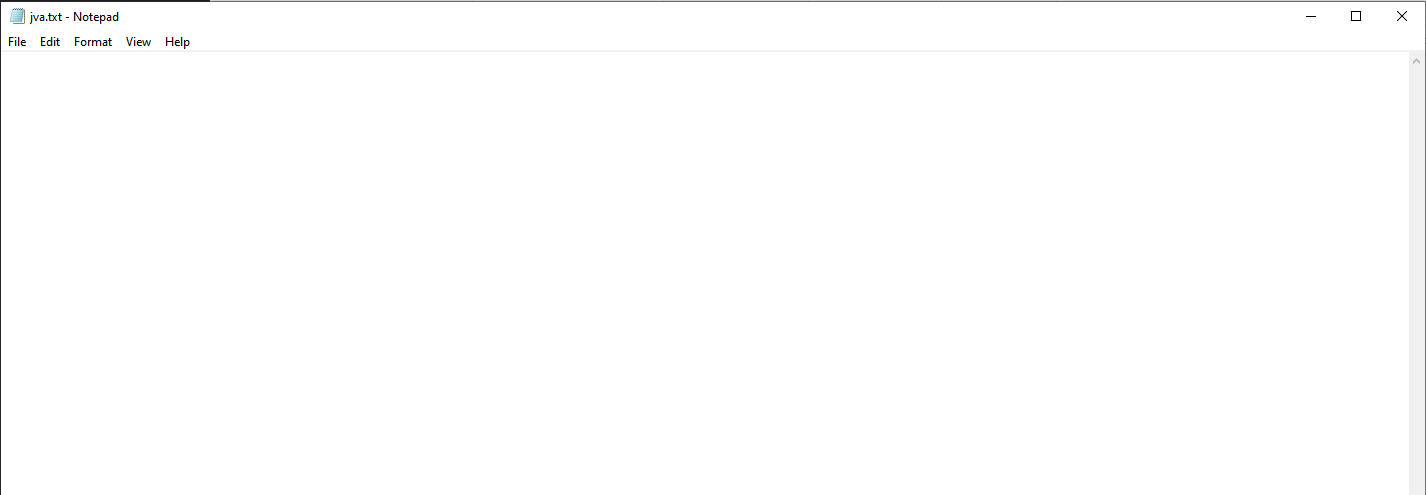
        }

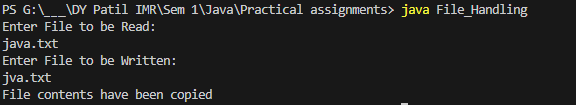
    }

}

**15.Output:**







**16. Write Java AWT code to accept Student information and display Student details on the Screen.**

package Student;

import java.awt.EventQueue;

import javax.swing.JFrame;

import javax.swing.JPanel;

import javax.swing.border.EmptyBorder;

import javax.swing.JTextField;

import javax.swing.JLabel;

import javax.swing.JOptionPane;

import javax.swing.JButton;

import java.awt.event.ActionListener;

import java.awt.event.ActionEvent;

public class Student\_details extends JFrame {

    private static final long serialVersionUID = 1L;

    private JPanel contentPane;

    private JTextField textField;

    private JTextField textField\_1;

    private JTextField textField\_2;

    private JTextField textField\_3;

    /\*\*

     \* Launch the application.

     \*/

    public static void main(String[] args) {

        EventQueue.invokeLater(new Runnable() {

            public void run() {

                try {

                    Student\_details frame = new Student\_details();

                    frame.setVisible(true);

                } catch (Exception e) {

                    e.printStackTrace();

                }

            }

        });

    }

    /\*\*

     \* Create the frame.

     \*/

    public Student\_details() {

        setDefaultCloseOperation(JFrame.EXIT\_ON\_CLOSE);

        setBounds(100, 100, 649, 484);

        contentPane = new JPanel();

        contentPane.setBorder(new EmptyBorder(5, 5, 5, 5));

        setContentPane(contentPane);

        contentPane.setLayout(null);

        textField = new JTextField();

        textField.setBounds(178, 45, 226, 46);

        contentPane.add(textField);

        textField.setColumns(10);

        textField\_1 = new JTextField();

        textField\_1.setColumns(10);

        textField\_1.setBounds(178, 161, 226, 46);

        contentPane.add(textField\_1);

        textField\_2 = new JTextField();

        textField\_2.setColumns(10);

        textField\_2.setBounds(178, 104, 226, 46);

        contentPane.add(textField\_2);

        textField\_3 = new JTextField();

        textField\_3.setColumns(10);

        textField\_3.setBounds(178, 230, 226, 46);

        contentPane.add(textField\_3);

        JLabel lblNewLabel = new JLabel("Student name");

        lblNewLabel.setBounds(69, 58, 84, 21);

        contentPane.add(lblNewLabel);

        JLabel lblNewLabel\_1 = new JLabel("Student Roll no.");

        lblNewLabel\_1.setBounds(69, 120, 84, 14);

        contentPane.add(lblNewLabel\_1);

        JLabel lblNewLabel\_2 = new JLabel("Contact");

        lblNewLabel\_2.setBounds(69, 177, 46, 14);

        contentPane.add(lblNewLabel\_2);

        JLabel lblNewLabel\_3 = new JLabel("Email");

        lblNewLabel\_3.setBounds(69, 246, 46, 14);

        contentPane.add(lblNewLabel\_3);

        contentPane.setName("Student Information");

        JButton btnNewButton = new JButton("Submit");

        btnNewButton.addActionListener(new ActionListener() {

            public void actionPerformed(ActionEvent e) {

                String name = textField.getText();

                String rollno = textField\_1.getText();

                String contact = textField\_2.getText();

                String email = textField\_3.getText();

                JOptionPane.showMessageDialog(btnNewButton, "Name: "+name+"\nRollno: "+rollno+"\nContact: "+contact+"\nEmail id: "+email);

            }

        });

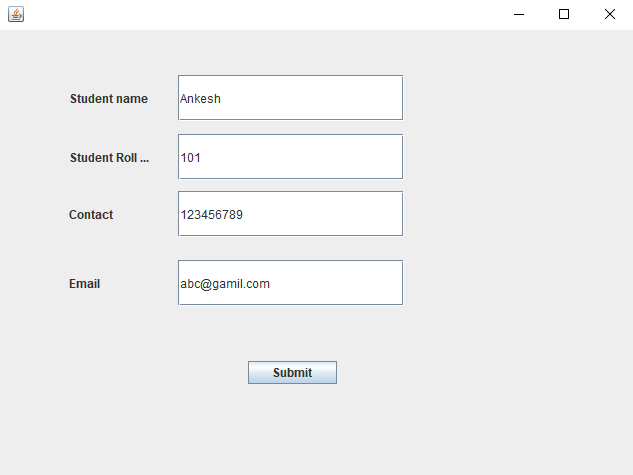
        btnNewButton.setBounds(248, 331, 89, 23);

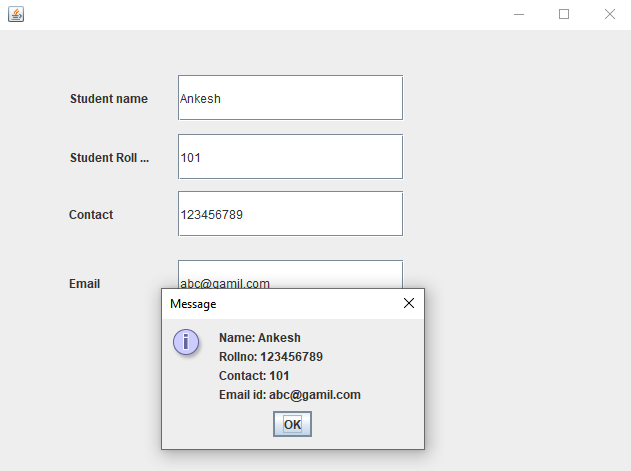
        contentPane.add(btnNewButton);

    }

}

**16.Output:**





**17 Write a JAVA program to design a screen using Swing to perform String operations.**

package Student;

import java.awt.EventQueue;

import javax.swing.JFrame;

import javax.swing.JPanel;

import javax.swing.border.EmptyBorder;

import javax.swing.JTextField;

import javax.swing.JLabel;

import javax.swing.JButton;

import java.awt.event.ActionListener;

import java.awt.event.ActionEvent;

public class String\_operations extends JFrame {

    private static final long serialVersionUID = 1L;

    private JPanel contentPane;

    private JTextField textField;

    private JTextField textField\_1;

    private JTextField textField\_2;

    private JTextField textField\_3;

    /\*\*

     \* Launch the application.

     \*/

    public static void main(String[] args) {

        EventQueue.invokeLater(new Runnable() {

            public void run() {

                try {

                    String\_operations frame = new String\_operations();

                    frame.setVisible(true);

                } catch (Exception e) {

                    e.printStackTrace();

                }

            }

        });

    }

    /\*\*

     \* Create the frame.

     \*/

    public String\_operations() {

        setDefaultCloseOperation(JFrame.EXIT\_ON\_CLOSE);

        setBounds(100, 100, 639, 450);

        contentPane = new JPanel();

        contentPane.setBorder(new EmptyBorder(5, 5, 5, 5));

        setContentPane(contentPane);

        contentPane.setLayout(null);

        textField = new JTextField();

        textField.setBounds(113, 63, 86, 20);

        contentPane.add(textField);

        textField.setColumns(10);

        textField\_1 = new JTextField();

        textField\_1.setBounds(324, 63, 86, 20);

        contentPane.add(textField\_1);

        textField\_1.setColumns(10);

        textField\_2 = new JTextField();

        textField\_2.setBounds(209, 144, 216, 20);

        contentPane.add(textField\_2);

        textField\_2.setColumns(10);

        JLabel lblNewLabel = new JLabel("String 1");

        lblNewLabel.setBounds(43, 66, 46, 14);

        contentPane.add(lblNewLabel);

        JLabel lblNewLabel\_1 = new JLabel("String 2");

        lblNewLabel\_1.setBounds(268, 66, 46, 14);

        contentPane.add(lblNewLabel\_1);

        JLabel lblNewLabel\_2 = new JLabel("Result");

        lblNewLabel\_2.setBounds(153, 147, 46, 14);

        contentPane.add(lblNewLabel\_2);

        JButton btnNewButton = new JButton("Concatenate");

        btnNewButton.addActionListener(new ActionListener() {

            public void actionPerformed(ActionEvent e) {

                String s1 = textField.getText();

                String s2 = textField\_1.getText();

                String s3 = s1+s2;

                textField\_2.setText(s3);

            }

        });

        btnNewButton.setBounds(96, 235, 106, 23);

        contentPane.add(btnNewButton);

        JButton btnNewButton\_1 = new JButton("Sub String");

        btnNewButton\_1.addActionListener(new ActionListener() {

            public void actionPerformed(ActionEvent e) {

                String s1 = textField.getText();

                String s2 = textField\_1.getText();

                int i = Integer.parseInt(textField\_3.getText());

                textField\_2.setText(s1.substring(0, i)+s2+s1.substring(i+1));

            }

        });

        btnNewButton\_1.setBounds(247, 235, 89, 23);

        contentPane.add(btnNewButton\_1);

        JButton btnNewButton\_1\_2 = new JButton("Length");

        btnNewButton\_1\_2.addActionListener(new ActionListener() {

            public void actionPerformed(ActionEvent e) {

                textField\_2.setText(String.valueOf(textField.getText().length()));

            }

        });

        btnNewButton\_1\_2.setBounds(393, 235, 89, 23);

        contentPane.add(btnNewButton\_1\_2);

        JButton btnNewButton\_1\_3 = new JButton("Equality");

        btnNewButton\_1\_3.addActionListener(new ActionListener() {

            public void actionPerformed(ActionEvent e) {

                textField\_2.setText(textField.getText().equals(textField\_1.getText())?"The Given strings are equal":"The given Strings are not equal");

            }

        });

        btnNewButton\_1\_3.setBounds(324, 298, 89, 23);

        contentPane.add(btnNewButton\_1\_3);

        JButton btnNewButton\_1\_4 = new JButton("Reverse");

        btnNewButton\_1\_4.addActionListener(new ActionListener() {

            public void actionPerformed(ActionEvent e) {

                StringBuilder b = new StringBuilder(textField.getText());

                b.reverse();

                textField\_2.setText(String.valueOf(b));

            }

        });

        btnNewButton\_1\_4.setBounds(179, 298, 89, 23);

        contentPane.add(btnNewButton\_1\_4);

        textField\_3 = new JTextField();

        textField\_3.setColumns(10);

        textField\_3.setBounds(492, 63, 86, 20);

        contentPane.add(textField\_3);

        JLabel lblNewLabel\_1\_1 = new JLabel("Index");

        lblNewLabel\_1\_1.setBounds(448, 66, 34, 14);

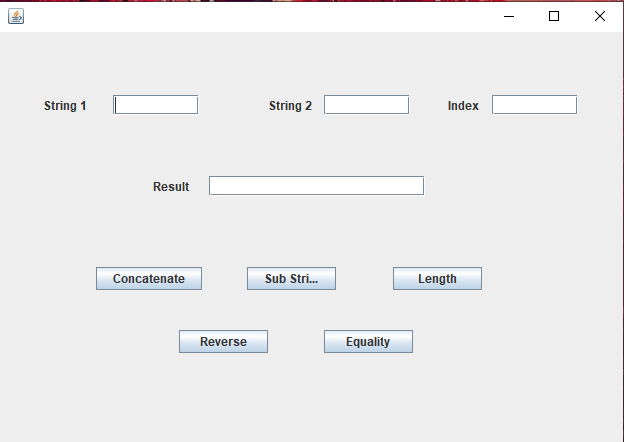
        contentPane.add(lblNewLabel\_1\_1);

    }

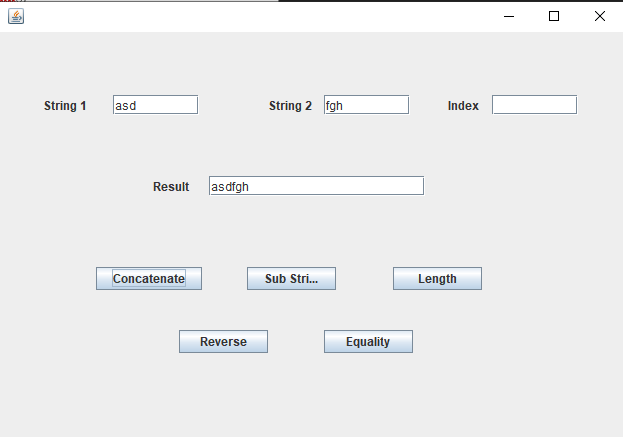
}

**17.Output:**

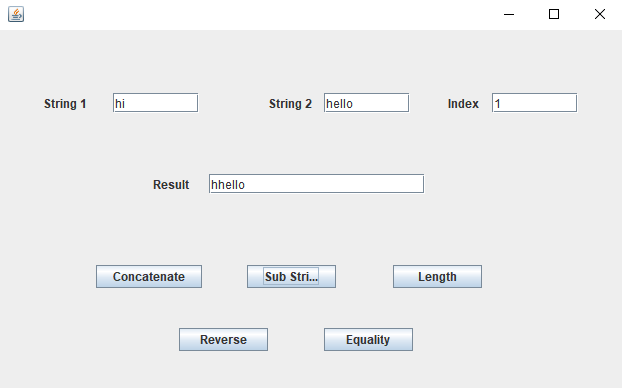
**Idle:**



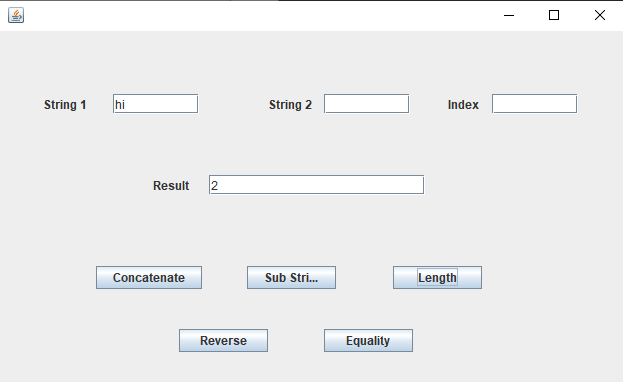
**Concatenate:**



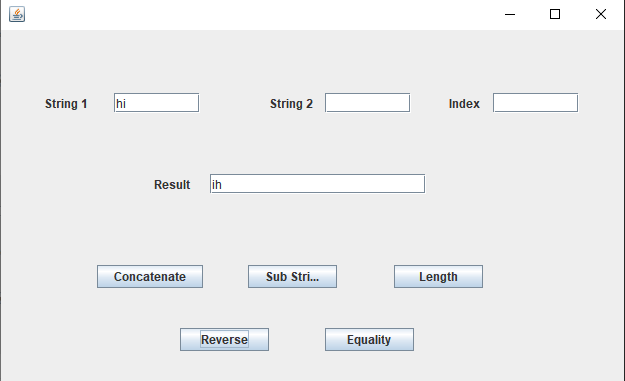
**SubString:**



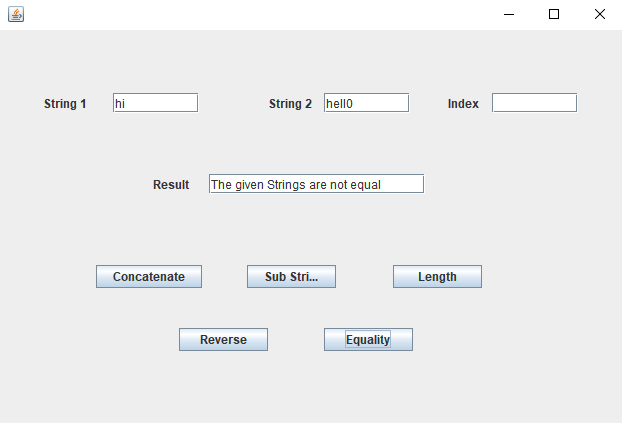
**Length:**



**Reverse:**



**Equality:**



**18 Write a Java code to Read, Insert, Update and Delete any record from the database.(Employee table).**

package Student;

import java.sql.\*;

import java.util.Scanner;

public class Employe {

    public static void main(String args[]) {

        try {

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

            Scanner S = new Scanner(System.in);

            while(true) {

                System.out.println("1.Insert\n2.Read\n3.Update\n4.Delete\nEnter Your Choice: ");

                int x = S.nextInt();

            switch(x) {

            // Insert

            case 1:

                System.out.println("id = ");

                int id = S.nextInt();

                System.out.println("name = ");

                String name = S.next();

                System.out.println("salary = ");

                int sal = S.nextInt();

                String q = "INSERT INTO employee values(?,?,?)";

                PreparedStatement ps = con.prepareStatement(q);

                ps.setInt(1, id);

                ps.setString(2, name);

                ps.setInt(3, sal);

                int r = ps.executeUpdate();

                System.out.println((r > 0) ? "Data Inserted successfully" : "Data was not inserted");

                break;

            // Read

            case 2:

                q = "select eid,ename,sal from employee";

                ps = con.prepareStatement(q);

                ResultSet rs = ps.executeQuery();

                System.out.println("\n");

                while (rs.next()) {

                    System.out.println("Id: " + rs.getInt(1) + " Name: " + rs.getString(2) + " Salary: " + rs.getInt(3));

                }

                System.out.println("\n");

                break;

            // Update

            case 3:

                System.out.println("id to update = ");

                int id1 = S.nextInt();

                System.out.println("new salary = ");

                int sal1 = S.nextInt();

                q = "Update employee set sal=? where eid = ?";

                ps = con.prepareStatement(q);

                ps.setInt(1, sal1);

                ps.setInt(2, id1);

                r = ps.executeUpdate();

                System.out.println((r > 0) ? "Update was successfully preformed changing employee id "+id1+"'s salary to "+sal1: "No Such id was Found");

                break;

            // Delete

            case 4:

                System.out.println("id to delete = ");

                int id2 = S.nextInt();

                q = "Delete from employee where eid =?";

                ps = con.prepareStatement(q);

                ps.setInt(1, id2);

                r = ps.executeUpdate();

                System.out.println((r > 0) ? "Employee with id "+id2+" was deleted." : "No Such id was Found");

                break;

            case 5: System.exit(0);

            default: System.out.println("Enter a valid choice");

            }

            }

        } catch (Exception e) {

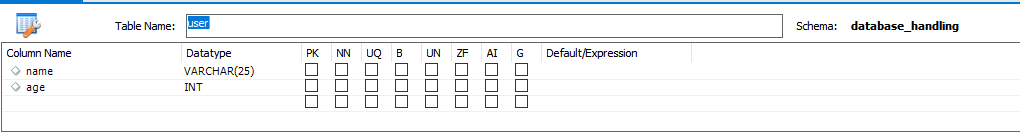
            System.out.println(e);

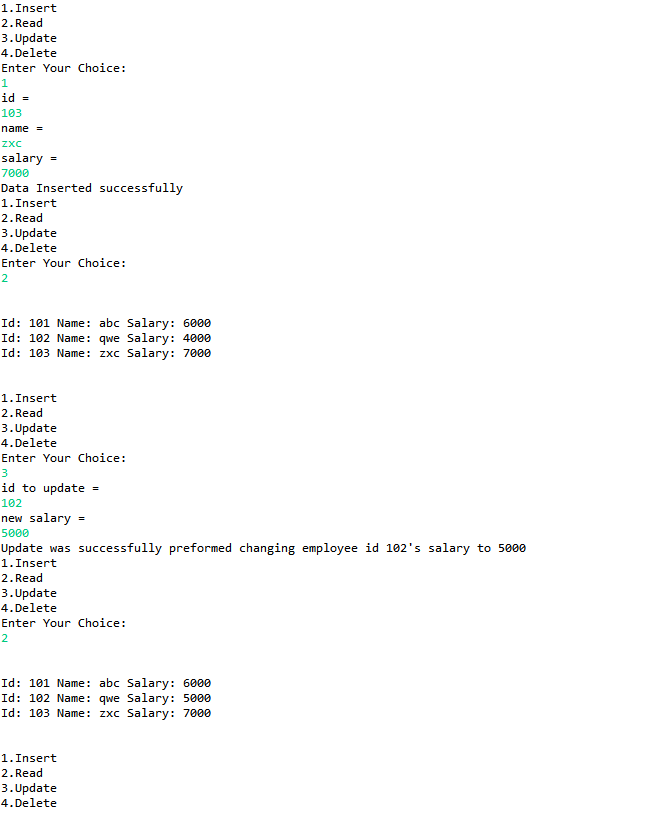
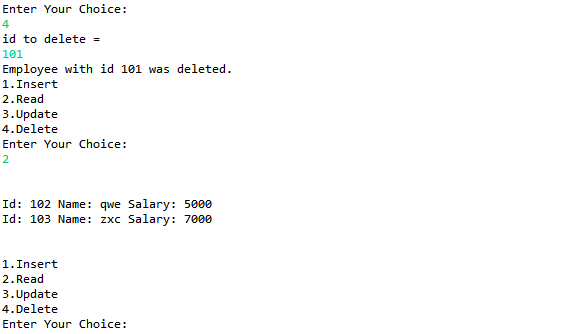
        }

    }

}

**Database schema:**

****

**18.Output:**. 

**19 Write a Java Servlet Application for login page with proper validations.**

**web.xml**

<?xml version="1.0" encoding="UTF-8"?>

<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="https://jakarta.ee/xml/ns/jakartaee" xsi:schemaLocation="https://jakarta.ee/xml/ns/jakartaee https://jakarta.ee/xml/ns/jakartaee/web-app\_5\_0.xsd" id="WebApp\_ID" version="5.0">

<display-name>Question 19</display-name>

<welcome-file-list>

<welcome-file>index.html</welcome-file>

<welcome-file>index.jsp</welcome-file>

<welcome-file>index.htm</welcome-file>

<welcome-file>default.html</welcome-file>

<welcome-file>default.jsp</welcome-file>

<welcome-file>default.htm</welcome-file>

</welcome-file-list>

<servlet>

<description></description>

<display-name>Login</display-name>

<servlet-name>Login</servlet-name>

<servlet-class>Login\_Page.Login</servlet-class>

</servlet>

<servlet-mapping>

<servlet-name>Login</servlet-name>

<url-pattern>/Login</url-pattern>

</servlet-mapping>

</web-app>

**login.html**

<!DOCTYPE html>

<html>

<head>

<meta charset="UTF-8">

<title>Login page</title>

<style>

body{

display: flex;

justify-content: center;

align-items: center;

height: 97vh;

width: 100%;

}

#body{ display: flex;

flex-direction: column;

}

#submit,#reset{

width: 100px;

align-self: center;

margin-bottom: 10px;

}

</style>

</head>

<body>

<form action ="Login" method="post">

<div id ="header"><h1>Welcome To Login Page</h1></div>

<div id = "body">

User-mail: <input type = "email" name = "uname" required><br>

Password: <input type = "password" name = "pass" required><br>

<input type="submit" id ="submit"><input type="reset" id = "reset">

</div>

</form>

</body>

</html>

**Login.java**

package Login\_Page;

import jakarta.servlet.ServletException;

import jakarta.servlet.annotation.WebServlet;

import jakarta.servlet.http.HttpServlet;

import jakarta.servlet.http.HttpServletRequest;

import jakarta.servlet.http.HttpServletResponse;

import java.io.IOException;

import java.io.PrintWriter;

/\*\*

 \* Servlet implementation class Login

 \*/

public class Login extends HttpServlet {

    private static final long serialVersionUID = 1L;

    final String umail ="abc@gmail.com";

    final String pwd= "123456789";

    /\*\*

     \* Default constructor.

     \*/

    public Login() {

        // TODO Auto-generated constructor stub

    }

    /\*\*

     \* @see HttpServlet#doGet(HttpServletRequest request, HttpServletResponse response)

     \*/

    protected void doGet(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException {

        // TODO Auto-generated method stub

        PrintWriter out = response.getWriter();

        String email = request.getParameter("uname");

        String pass = request.getParameter("pass");

        out.print((umail.equals(email) && pwd.equals(pass))?"Welcome to the site":"Wrong email or password");

    }

    /\*\*

     \* @see HttpServlet#doPost(HttpServletRequest request, HttpServletResponse response)

     \*/

    protected void doPost(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException {

        // TODO Auto-generated method stub

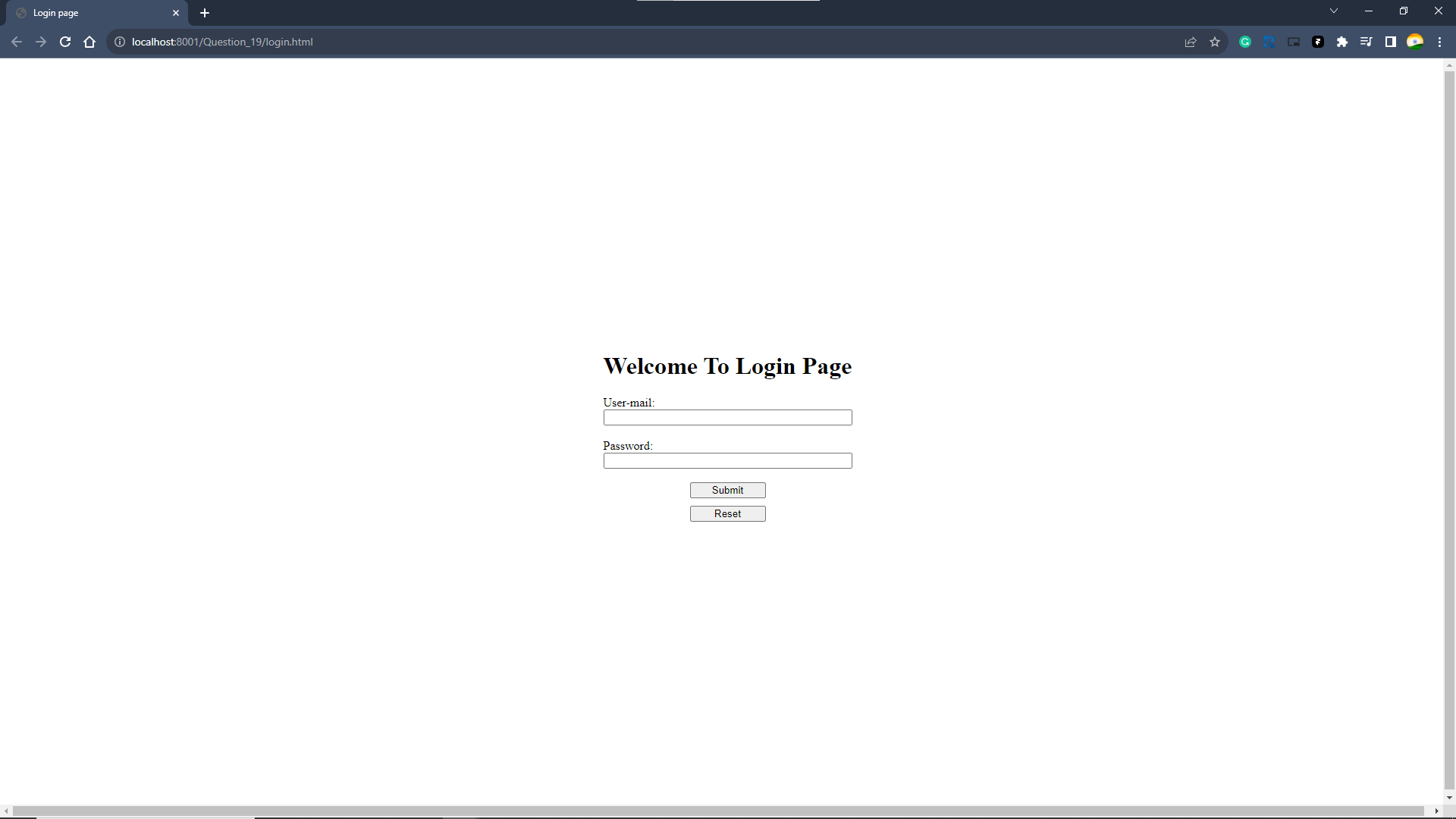
        doGet(request, response);

    }

}

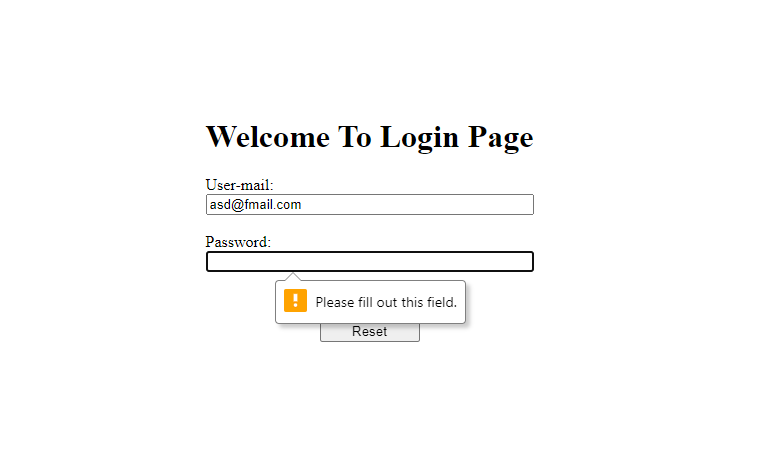
**19.Ouput:**

**Idle:**

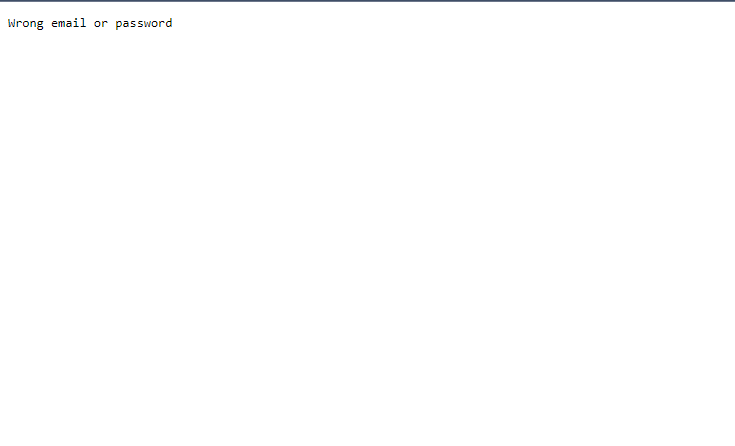
****

**Client-side validation:**

****

****

**Failed Login:**

****

**Login With Values:**

****

**Successful Login:**

****

**20 Write a Java program to design Registration page using JSP**

**20.Output:**