Program - 1

Create a class Vehicle. The class should have two fields – no_of_seats, no_of_wheels and a method showVehicle. Create two objects – motorcycle and car for this class. Display the output to show the descriptions for car and motorcycle.

Code:

```
public class vehicle
{
   int no_of_seats;
   int no_of_wheels;
   public vehicle(int numseats, int numwheels)
   {
      this.no_of_seats = numseats;
      this.no_of_wheels = numwheels;
   }
   public void showVehicle()
   {
      System.out.println("Total Number of seats: " + no_of_seats);
      System.out.println("Total Number of wheels: " + no_of_wheels);
   }
   public static void main(String[] args)
   {
      vehicle motorcycle = new vehicle(1,2);
      vehicle car = new vehicle(4,4);
      System.out.println("Details of Car:");
      car.showVehicle();
      System.out.println("Details of Motorcycle:");
      motorcycle.showVehicle();
   }
}
```

Output:

```
Details of Car:
Total Number of seats: 4
Total Number of wheels: 4
Details of Motorcycle:
Total Number of seats: 1
Total Number of wheels: 2
```

Program - 2

Write a program to make a package Balance which has Account class with display method in it. Import Balance package in another program to access display method of Account class to display account balance.

Code:

```
//Part-1 Package Creation
package balance;
import java.util.*;
public class Account
{
    long acc,bal;
    String name;
    public void read()throws Exception
    {
            Scanner in = new Scanner(System.in);
            System.out.println("Enter the name :");
            name=in.nextLine();
            System.out.println("Enter the account number :");
            acc=Long.parseLong(in.nextLine());
            System.out.println("Enter the account balance :");
            bal=Long.parseLong(in.nextLine());
    }
    public void disp()
    {
            System.out.println("~~~~~~~~~~~~~~~~~~");
            System.out.println("--- Account Details ---");
            System.out.println("~~~~~~~~~~~~~~~~~~");
            System.out.println("Name :"+name);
            System.out.println("Account number :"+acc);
            System.out.println("Balance :"+bal);
    }
}
//Part – 2 Main Class
class BankBal
{
    public static void main(String ar[])
    {
            try
            {
                    balance.Account a=new balance.Account();
                    a.read(); //calling the method of Account class
```

```
                a.disp();
            }
            catch (Exception e)
            {
                System.out.println(e);
            }
        }
    }
```

Output:

```
Enter the name:
Rithik K M
Enter the account number:
1235678429
Enter the account balance:
2987
~~~~~~~~~~~~~~~~~~
----Account Details----
~~~~~~~~~~~~~~~~~~
Name: Rithik K M
Account number 1235678429
Balance: 2987
```

Program - 3

Design a super class called Employee with details as EmployeeId, name, Phone, Salary. Extend this class by writing three subclasses namely Teaching (domain, publications), Technical (skills), and Contract (period). Write a JAVA program to read and display at least 3 Employee objects of all three categories.

Code:

```
import java.util.*;
class Employee
{
   String EmpID;
   String Empname;
   long EmpPhone;
   float EmpSalary;
   public void accept()
   {
      Scanner obj = new Scanner(System.in);
      System.out.println("Enter Staff ID: ");
      EmpID = obj.nextLine();
      System.out.println("Enter Name: ");
      Empname = obj.nextLine();
      System.out.println("Enter Phone number: ");
      EmpPhone = obj.nextLong();
      System.out.println("Enter Salary: ");
      EmpSalary = obj.nextFloat();
   }
   public void display()
   {
      System.out.println("Staff ID: " + EmpID);
      System.out.println("Name: " + Empname);
      System.out.println("Phone: " + EmpPhone);
      System.out.println("Salary: " + EmpSalary);
   }
}
class Teaching extends Employee
{
   String domain;
   int n;
   public void accept()
   {
      super.accept();
      Scanner obj = new Scanner(System.in);
```

```
        System.out.println("Enter Domain:");
        domain = obj.nextLine();
        System.out.println("Enter number of Publications:");
        n = obj.nextInt();
    }
    public void display()
    {
        super.display();
        System.out.println("Doamin:" + domain);
        System.out.println("Publications: " + n);
    }
}
class Technical extends Employee
{
    String skill;
    public void accept()
    {
        super.accept();
        Scanner obj = new Scanner(System.in);
        System.out.println("Enter Technical Skills:");
        skill = obj.nextLine();

    }
    public void display()
    {
        super.display();
        System.out.println("Technical Skills: " + skill);
    }
}
class Contract extends Employee
{
    int period;
    public void accept()
    {
        super.accept();
        Scanner obj = new Scanner(System.in);
        System.out.println("Enter Period:");
        period = obj.nextInt();
    }
    public void display()
    {
        super.display();
        System.out.println("Contract Period: " + period);
```

```
    }
}
class EmployeeFour
{
   public static void main(String[] args)
   {
      Teaching teach = new Teaching();
      System.out.println("Enter the details of Teaching Staff:");
      teach.accept();
      Technical tech = new Technical();
      System.out.println("Enter the details of Technical Staff:");
      tech.accept();
      Contract con = new Contract();
      System.out.println("Enter the details of Contract Staff:");
      con.accept();
      System.out.println("The details of Teaching Staff:");
      teach.display();
      System.out.println("The details of Technical Staff:");
      tech.display();
      System.out.println("The details of Contract Staff:");
      con.display();
   }
}
```

Output:

```
Enter the details of Teaching Staff:
Enter Staff ID:
DS287
Enter Name:
Rahul M S
Enter Phone number:
7812356497
Enter Salary:
78567.89
Enter Domain:
Web Development
Enter number of Publications:
28

Enter the details of Technical Staff:
Enter Staff ID:
DS307
Enter Name:
```

Deepak Nayak
Enter Phone number:
8234156729
Enter Salary:
95532.56
Enter Technical Skills:
Machine Learning, Python and Java

Enter the details of Contract Staff:
Enter Staff ID:
Ds187
Enter Name:
Priya Hedge
Enter Phone number:
9234156987
Enter Salary:
89595
Enter Period:
5

The details of Teaching Staff:
Staff ID: DS287
Name: Rahul M S
Phone: 7812356497
Salary: 78567.89
Doamin: Web Development
Publications: 28

The details of Technical Staff:
Staff ID: DS307
Name: Deepak Nayak
Phone: 8234156729
Salary: 95532.56
Technical Skills: Machine Learning, Python and Java

The details of Contract Staff:
Staff ID: Ds187
Name: Priya Hedge
Phone: 9234156987
Salary: 89595.0
Contract Period: 5

Program – 4

Implement a JAVA program to read two integers a and b. Compute a/b and print, when b is not zero. Raise an exception when b is equal to zero. Also demonstrate working of ArrayIndexOutOfBoundException.

Code:

```
import java.util.Scanner;
class ExceptionDemo
{
	public static void main(String[] args)
	{
		int a,b,result;
		Scanner input =new Scanner(System.in);
		System.out.println("Input two integers");
		a=input.nextInt();
		b=input.nextInt();
		try
		{
			result=a/b;
			System.out.println("Result = "+result);
		}
		catch(ArithmeticException e)
		{
			System.out.println("exception caught: Divide by zero
			error"+e);
		}
		int array[]={2,3,4,5,6};
		try
		{
			System.out.println("Input two integers"+array[5]);
		}
		catch(ArrayIndexOutOfBoundsException e1)
		{
			System.out.println("array index out of bound"+e1);
		}
	}
}
```

Output:

```
Input two numbers:
3 0
Exception caught: Divide by zero error
Java.lang.ArithmeticException: / by zero
Array Index Out of Bound
Java.lang.ArrayIndexOutofBoundException:
5
```

Program – 5

Implement Java Program to Get the Components of any give URL such as Protocol, file, port and host.

Code:

```
import java.net.URL;
public class URLMain
{
	 public static void main(String[] args)
	{
	try
	{
		URL url = new
		URL("https://www.example.com/path/to/file.html?key=value#fra
		gment");
		System.out.println("Protocol: " + url.getProtocol());
		System.out.println("Host: " + url.getHost());
		System.out.println("Port: " + url.getPort());
		System.out.println("Path: " + url.getPath());
		System.out.println("Query: " + url.getQuery());
		System.out.println("Fragment: " + url.getRef());
	}
	catch (Exception e)
	{
		System.out.println("Error: " + e.getMessage());
	}
}
```

Output:

```
Protocol: https
Host: www.example.com
Port: -1
Path: /path/file.html
Query: key=value
Fragment: fragment
```

Program – 6

Implement client-server communication, where client can send the message and server can receive the message without internet.

Code:

```
//Part-1 ServerSide.java
import java.io.*;
import java.net.*;
public class ServerSide
{
	public static void main(String[]args)
	{
	try
	{
		ServerSocket ss=new ServerSocket(3306);
		Socket s=ss.accept();//establishes connection
		DataInputStream dis=new DataInputStream(s.getInputStream());
		String str=(String)dis.readUTF();
		System.out.println("message= "+str);
		ss.close();
	}
	catch(Exception e)
	{
		System.out.println(e);
	}
}

//Part-2 ClientSide.java
import java.io.*;
import java.net.*;
public class ClientSide
{
	public static void main(String[] args)
	{
	try
	{
		Socket s=new Socket("localhost",3306);
		DataOutputStreamdout=new
		DataOutputStream(s.getOutputStream());
		dout.writeUTF("Hello Server");
		dout.flush();
```

```
                dout.close();
                s.close();
            }
            catch(Exception e)
            {
                System.out.println(e);}
            }
        }
```

Output:

Message = Hello Server

Program - 7

Implement JDBC program to insert and retrieve student (student_name, student_usn, student_dept) record from student database.

Code:

```
//Part - 1 Insert Details
import java.sql.*;
import java.util.*;
public class InsertDetails
{
	public static void main(String[] args)
	{
		String usn, name, dept;
		Scanner obj = new Scanner(System.in);
		System.out.println("Enter Student Name:");
		name = obj.nextLine();
		System.out.println("Enter Student USN:");
		usn = obj.nextLine();
		System.out.println("Enter Student Dept:");
		dept = obj.nextLine();
		try
		{
			Class.forName("com.mysql.jdbc.Driver");
			Connection con = DriverManager.getConnection
			("jdbc:mysql://localhost:3306/Student","root","root");
			Statement stmt = con.createStatement();
			String q1 = "insert into student values('"
			+usn+"','"+name+"','"+dept+"')";
			int x = stmt.executeUpdate(q1);
			if(x>0)
				System.out.println("Successfully Inserted");
			else
				System.out.println("Insert Failed");
			con.close();
		}
		catch(Exception e)
		{
			System.out.println(e);
		}
	}
}
```

Output:

```
Enter Student Name:
Shreyas
Enter Student USN:
1DS22AI010
Enter Student Dept:
AIML
Successfully Inserted
```

Code:

```
//Part-2 Retrieve Details
import java.sql.*;
public class RetrieveDetails
{
	public static void main(String[] args)
	{
		try
		{
			Class.forName("com.mysql.jdbc.Driver");
			Connection con = DriverManager.getConnection
			("jdbc:mysql://localhost:3306/Student","root","root");
			Statement stmt = con.createStatement();
			ResultSet rs= stmt.executeQuery("select * from student");
			while(rs.next())
				System.out.println(rs.getString(1)+"
				"+rs.getString(2)+" "+rs.getString(3));
			con.close();
		}
		catch(Exception e)
		{
			System.out.println(e);
		}
	}
}
```

Output:

1DS22IS073	Rithik	ISE
1DS22EC044	Dhanya	ECE
1DS22AI010	Shreyas	AIML

Program – 8

Create web page authentication using JSP and JDBC connectivity (login authentication) using session.

Code:

Login.html

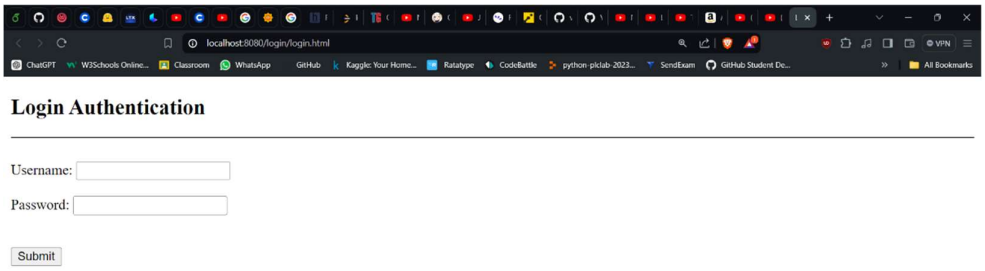
```
<html>
   <head>
      <title>Login</title>
      <meta charset="UTF-8">
      <meta name="viewport" content="width=device-width, initial-scale=1.0">
   </head>
   <body>
      <form action="Login.jsp" method="post" id="styleform">
      <h2>Login Authentication</h2><hr color="black"><br>
      Username: <input type="text" name="user"/><br><br>
      Password: <input type="password" name="pwd"/><br><br><br>
      <input type="submit" value="Submit" id="stylesub"/>
      </form>
   </body>
</html>
```

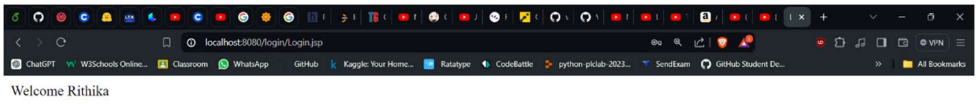
Login.jsp

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
   <head>
   <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
   <title>Login</title>
   </head>
   <body>
   <%@ page import ="java.sql.*" %>
   <%@ page import ="javax.sql.*" %>
   <%String username = request.getParameter("user");
   String pwd = request.getParameter("pwd");
   Class.forName("com.mysql.jdbc.Driver");
   java.sql.Connection con =
DriverManager.getConnection("jdbc:mysql://localhost:3306/app","root","root");
   Statement st= con.createStatement();
```

```
    ResultSet rs= st.executeQuery("select * from login where
    username='"+username+"'");
    if(rs.next())
    {if(rs.getString(2).equals(pwd)) {
       session.setAttribute("user",rs.getString(1));
       String name=(String)session.getAttribute("user");
       out.println("Welcome "+ name);
    }else
    System.out.println("Invalid password try again");
    }
    %></body>
</html>
```

Output:





Program – 9

Structure the java servlet program to fetch the student details using JDBC.

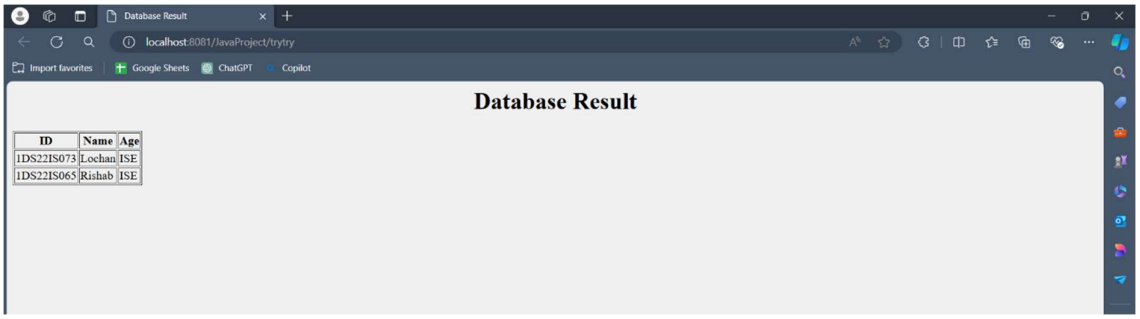
Code:

```
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import java.sql.*;

public class P9_DatabaseAccess extends HttpServlet
{
      public void doGet(HttpServletRequest request, HttpServletResponse
      response) throws ServletException, IOException
      {
        String JDBC_DRIVER = "com.mysql.jdbc.Driver";
        String DB_URL="jdbc:mysql://localhost/ise";
        String USER = "root";
        String PASS = "root";
        response.setContentType("text/html");
        PrintWriter out = response.getWriter();
        String title = "Database Result";
        String docType =
        "<!doctype html public \"-//w3c//dtd html 4.0 " + "transitional//en\">\n";
        out.println(docType +
        "<html>\n" +
        "<head><title>" + title + "</title></head>\n" +
        "<body bgcolor = \"#f0f0f0\">\n" +
        "<h1 align = \"center\">" + title + "</h1>\n");
        try
        {
              Class.forName("com.mysql.jdbc.Driver");
              Connection conn = DriverManager.getConnection(DB_URL, USER,
              PASS);
              Statement stmt = conn.createStatement();
              String sql;
              sql = "SELECT * from emp";
              ResultSet rs = stmt.executeQuery(sql);
```

```
                out.println("<table border=1>");
                out.println("<tr><th>ID</th><th>Name</th><th>Age</th></tr>");
                while(rs.next())
                {
                        int id  = rs.getInt(1);
                        String name = rs.getString(2);
                        String age = rs.getString(3);
                        out.println(
                        "<tr><td>"+id+"</td><td>"+name+"</td><td>"+age+
                        "</td></tr>");
                        out.println("<br>");
                }
                out.println("</body></html>");
                rs.close();
                stmt.close();
                conn.close();
        }
        catch(SQLException se)
        {
                out.println(se);
                se.printStackTrace();
        }
        catch(Exception e)
        {
                 e.printStackTrace();
                out.println(e);
        }
    }
}
```

Output:



Program - 10

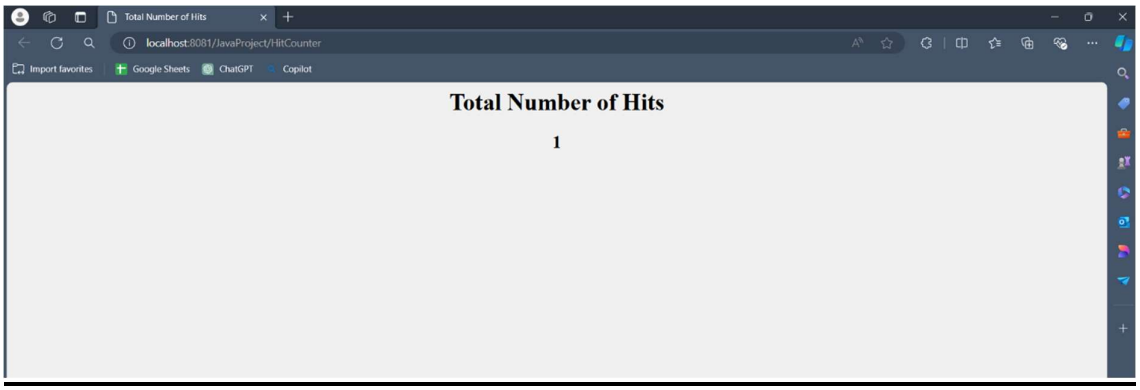
Develop a Servlet program to demonstrate hit counter.

Code:

```
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class P10_1HitCounter extends HttpServlet
{
   private int hitcounter;
   public void init()
   {
      hitcounter = 0;
   }
   public void doGet(HttpServletRequest request, HttpServletResponse response)
   throws ServletException, IOException
   {
      // Set response content type response.setContentType("text/html");
      hitcounter++;
      PrintWriter out = response.getWriter();
      String title = "Total Number of Hits";
      String docType = "<!doctype html public \"-//w3c//dtd html 4.0 " +
      "transitional//en\">\n";
      out.println(docType + "<html>\n" +
      "<head><title>" + title + "</title></head>\n"
            + "<body bgcolor = \"#f0f0f0\">\n" +
      "<h1 align = \"center\">" + title + "</h1>\n" +
            "<h2 align = \"center\">" + hitcounter + "</h2>\n"
            + "</body> </html>"
      );
   }
   public void destroy() {
   // This is optional step but if you like you
   // can write hitCount value in your database.
   }
}
```

Output:


Total Number of Hits
localhost:8081/JavaProject/HitCounter
Import favorites
Google Sheets
ChatGPT
Copilot
Total Number of Hits
1