# VIT,

**VELLORE**

# PERIODIC ASSESMENT TEST – 1

**JAVA PROGRAMMING LAB**

**(PMCA501P)**

**CLASS**

**SUBMITTED TO:- SUBMITTED BY :- MR. SETHIL MURUGAN B**

**NAME**

**SCORE**

# PROGRAM 1

Write a Java program to copy the contents of one file into another file using File I/O Steams. Determine number of vowels in a file and display in standard output.

import java.io.File;

import java.io.FileInputStream; import java.io.FileOutputStream;

import java.io.IOException; public class Files1 {

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

File f1 = new File("FirstFile.txt"); FileOutputStream fos = new FileOutputStream(f1); String s = "This is the content of first file."; byte b[] = s.getBytes();

fos.write(b);

fos.close();

//Second File

File f2 = new File("FirstFileCopy.txt"); FileOutputStream fos2 = new FileOutputStream(f2); FileInputStream fis = new FileInputStream(f1); int ch;

while ((ch = fis.read()) != -1) { fos2.write(ch);

}

fis.close();

fos2.close();

FileInputStream fis2 = new FileInputStream(f2); int count = 0;

System.out.println("Displaying copied content in 2nd file:"); while ((ch = fis2.read()) != -1) {

char c = (char)ch;

if(c == 'a' || c == 'e' || c == 'i' || c == 'o' || c == 'u'

|| c == 'A' || c == 'E' || c == 'O' || c == 'I' || c == 'U') count++;

System.out.print(c);

}

System.out.println("\n\nNo. of vowels = "+ count); fis2.close();

}

}

# PROGRAM 2

Write a program that meets the following requirements:

* Create an array with 100 randomly chosen integers.
* Prompt the user to enter the index of the array, then display the corresponding element value. If the specified index is out of bounds, display the message Out of Bounds.

import java.util.Random; import java.util.Scanner;

public class Array {

public static void main(String[] args) { Scanner sc = new Scanner(System.in); Random r = new Random();

int arr[] = new int[100]; for(int i = 0; i < 100; i++){

arr[i] = r.nextInt(10000);

}

System.out.println("Enter Index: "); int idx = sc.nextInt();

try{

System.out.println("Value is: "+arr[idx]);

}catch(IndexOutOfBoundsException e){ System.out.println("Index Out of Bound Exception

Catched\n"+e);

}

}

}

# PROGRAM 3

In a triangle, the sum of any two sides is greater than the other side. The Triangle class must adhere to this rule. Create the IllegalTriangleException class, and modify the constructor of the Triangle class to throw an IllegalTriangleException object if a triangle is created with sides that violate the rule, as follows:

/\*\* Construct a triangle with the specified sides \*/

public Triangle(double side1, double side2, double side3)

throws IllegalTriangleException

{

// Implement it

}

import java.util.Scanner;

class IllegalTriangleException extends Exception{ String msg;

IllegalTriangleException(){

msg = "Sides of Triangle are invalid.\n";

}

public String toString(){ return msg;

}

}

class Triangle {

public Triangle(double side1, double side2, double side3)throws IllegalTriangleException

{

try{

if((side1+side2 < side3) || (side1+side3 < side2) || (side3+side2 < side1)){

throw new IllegalTriangleException();

}else{

System.out.println("Its a valid Triangle\n");

}

}catch(IllegalTriangleException e){ System.out.println("Exception: "+e);

}

}

}

public class TestTriangle {

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

Scanner sc = new Scanner(System.in); System.out.println("Enter 3 sides of triangle: "); double a = sc.nextDouble();

double b = sc.nextDouble(); double c = sc.nextDouble();

Triangle t = new Triangle(a, b, c);

}

}

# PROGRAM 4

Define a class Student with data members for name, ID , marks in 5 subjects, total and average. Capture necessary input, serialize the content into the file and deserialize the same to compute total and average.

import java.io.File;

import java.io.FileInputStream; import java.io.FileOutputStream; import java.io.IOException; import java.io.ObjectInputStream; import java.io.ObjectOutput; import java.io.ObjectOutputStream; import java.io.Serializable; import java.util.Scanner;

class Student implements Serializable{ int id;

String name;

float marks[] = new float[5];

Student(){

Scanner sc = new Scanner(System.in); System.out.print("Enter id: "); id = sc.nextInt(); System.out.print("Enter name: "); sc.nextLine(); name =

sc.nextLine();

for(int i = 0; i < 5; i++){

System.out.print("Enter marks for subject "+(i+1)+" :"); marks[i] = sc.nextFloat();

}

}

public String toString(){

return "Id "+id+"\nName "+name+"\nMarks 1: "+marks[0]+"\nMarks 2: "+marks[1]+"\nMarks 3: "+marks[2]+"\nMarks 4: "+marks[3]+"\nMarks 5: "+marks[4];

}

public void avg() {

System.out.println("Average "+((marks[0]+marks[1]+marks[2]+marks[3]+marks[4])/5));

}

public void total() {

System.out.println("Total "+(marks[0]+marks[1]+marks[2]+marks[3]+marks[4]));

}

}

public class FileHandling {

public static void main(String[] args) throws IOException, ClassNotFoundException {

Student obj = new Student(); File f = new File("Student.txt");

FileOutputStream fos = new FileOutputStream(f); ObjectOutputStream oos = new ObjectOutputStream(fos);

oos.writeObject(obj); oos.close();

fos.close();

System.out.println("Object Serialised in file.\n\n"); FileInputStream fis = new FileInputStream(f); ObjectInputStream ois = new ObjectInputStream(fis); Student obj1 = (Student)ois.readObject(); System.out.println("Object Deserialised from file."); System.out.println(obj1);

obj1.avg();

obj1.total();

ois.close();

fis.close();

}

}

# PROGRAM 5

Develop a package called mathprocess which has a class to do the following.

1. Define a static method to find factorial for the given parameter and it returns it.
2. Define another non-static method which takes array of integer as parameter and finds the average of the array. It returns the average value to the invoked program.

Design a test program in Java to import this package and demonstrate the methods.

package mathProcess; public class Package {

public static int factorial(int n){ if(n == 1 || n==0) return n; return n\*factorial(n-1);

}

public float average(int[]nums){ int sum = 0;

for(int n: nums){ sum += n;

}

return sum/nums.length;

}

}

import java.util.Scanner; import mathProcess.Package; public class TestMathProcess {

public static void main(String[] args) { Scanner sc = new Scanner(System.in);

System.out.print("Enter val to get factorial: ");int val = sc.nextInt();

System.out.println("Fatorial "+Package.factorial(val));

int[]m = new int[5]; for(int i = 0; i<5; i++){

System.out.print("Enter int:" );m[i] = sc.nextInt();

}

Package p = new Package(); System.out.println("Average "+p.average(m));

}

}

# PROGRAM 6

Create a table “Employee” in Derby database to represent employee details like id, name, gender, hobbies, BP(Basic Pay), DA(Dearness Allowance- 42%), HRA(House Rent Allowance-10%) in percentage, deductions (DED -4% to 8%), net pay (BP+HRA+DA- DED).

Develop a console based Java application to

* Insert ‘n’ records into the table. Collect id, name and BP, hobbies from the user, calculate HRA, DA, deductions as per the percentage and net pay as per the formulae.
* Display all records

(Note: **Include ‘derbyclient.jar’ in libraries under the project. Start the JavaDB server under ‘Services’ tab**)

/\*

* Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license- default.txt to change this license
* Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Main.java to edit this template

\*/

package javaapplication1; import java.sql.\*; import java.util.Scanner;

public class JavaApplication1 { public static Connection con;

public static PreparedStatement pstmt;

public static void main(String[] args) {

String url = "jdbc:oracle:thin:@localhost:1521:XE"; // Update with your Oracle DB details

String user = "system"; // Your Oracle DB username String password = "123"; // Your Oracle DB password

String insertQuery = "INSERT INTO Employee (id, name, gender, hobbies, BP, DA, HRA, DED, net\_pay) VALUES (?, ?, ?, ?, ?, ?, ?, ?, ?)";

try (Scanner sc = new Scanner(System.in)) {

// Load the Oracle JDBC Driver Class.forName("oracle.jdbc.driver.OracleDriver");

1));

// Establish connection to Oracle DB

con = DriverManager.getConnection(url, user, password);

// Prepare the SQL insert statement

pstmt = con.prepareStatement(insertQuery);

// Loop to insert 5 records for (int i = 0; i < 5; i++) {

System.out.println("Enter details for Employee " + (i +

// Get ID, Name, Gender, Hobbies, and BP from user System.out.print("Enter ID: ");

int id = sc.nextInt();

sc.nextLine(); // Consume the newline character

System.out.print("Enter Name: "); String name = sc.nextLine();

System.out.print("Enter Gender (M/F): "); char gender = sc.next().charAt(0);

sc.nextLine(); // Consume the newline character

System.out.print("Enter Hobbies: "); String hobbies = sc.nextLine();

System.out.print("Enter Basic Pay (BP): "); double BP = sc.nextDouble();

// Calculate DA (42% of BP), HRA (10% of BP), and DED (random between 4% to 8% of BP)

double DA = 0.42 \* BP; double HRA = 0.10 \* BP;

double DED = (4 + (Math.random() \* 4)) / 100 \* BP; // Random deduction between 4% to 8%

// Calculate Net Pay

double net\_pay = BP + DA + HRA - DED;

// Set values in PreparedStatement pstmt.setInt(1, id); pstmt.setString(2, name);

pstmt.setString(3, String.valueOf(gender)); pstmt.setString(4, hobbies); pstmt.setDouble(5, BP);

pstmt.setDouble(6, DA); pstmt.setDouble(7, HRA); pstmt.setDouble(8, DED); pstmt.setDouble(9, net\_pay);

// Execute insert statement pstmt.executeUpdate();

System.out.println("Employee " + (i + 1) + " inserted successfully.\n");

}

} catch (SQLException | ClassNotFoundException e) { e.printStackTrace();

} finally {

try {

if (pstmt != null) pstmt.close(); if (con != null) con.close();

} catch (SQLException e) { e.printStackTrace();

}

}

}

}

# PROGRAM 7

Create a Java Web Application for the Employee Payroll Management

1. Create a HTML form to capture the basic employee details like id, name and BP, hobbies. Submit the form to “PayCalcServlet” in which compute HRA as 10%, DA as 42% and deductions as 6.2% .
2. Display the employee details in HTML table format.

<!DOCTYPE html>

<html>

<head>

<title>Employee Payroll Form</title>

</head>

<body>

<h2>Employee Payroll Details</h2>

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

<label for="id">Employee ID:</label>

<input type="number" id="id" name="id" required><br><br>

<label for="name">Employee Name:</label>

<input type="text" id="name" name="name" required><br><br>

<label for="bp">Basic Pay (BP):</label>

<input type="number" step="0.01" id="bp" name="bp" required><br><br>

<label for="hobbies">Hobbies:</label>

<input type="text" id="hobbies" name="hobbies"><br><br>

<input type="submit" value="Submit">

</form>

</body>

</html>

import java.io.\*; import javax.servlet.\*;

import javax.servlet.http.\*;

public class PayCalcServlet extends HttpServlet {

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

response.setContentType("text/html");

// Get employee details from form

int id = Integer.parseInt(request.getParameter("id")); String name = request.getParameter("name");

double bp = Double.parseDouble(request.getParameter("bp")); String hobbies = request.getParameter("hobbies");

// Calculate payroll components double hra = 0.10 \* bp; // 10% HRA double da = 0.42 \* bp; // 42% DA

double deductions = 0.062 \* bp; // 6.2% Deductions double netPay = bp + hra + da - deductions;

// Set attributes to be forwarded to the JSP page request.setAttribute("id", id); request.setAttribute("name", name); request.setAttribute("bp", bp); request.setAttribute("hra", hra); request.setAttribute("da", da); request.setAttribute("deductions", deductions); request.setAttribute("netPay", netPay); request.setAttribute("hobbies", hobbies);

// Forward to the JSP page for displaying results RequestDispatcher dispatcher =

request.getRequestDispatcher("employeeDetails.jsp"); dispatcher.forward(request, response);

}

}

<!DOCTYPE html>

<html>

<head>

<title>Employee Payroll Details</title>

</head>

<body>

<h2>Employee Payroll Details</h2>

<table border="1">

<tr>

<th>Employee ID</th>

<td>${id}</td>

</tr>

<tr>

<th>Name</th>

<td>${name}</td>

</tr>

<tr>

<th>Basic Pay (BP)</th>

<td>${bp}</td>

</tr>

<tr>

<th>HRA (10%)</th>

<td>${hra}</td>

</tr>

<tr>

<th>DA (42%)</th>

<td>${da}</td>

</tr>

<tr>

<th>Deductions (6.2%)</th>

<td>${deductions}</td>

</tr>

<tr>

<th>Net Pay</th>

<td>${netPay}</td>

</tr>

<tr>

<th>Hobbies</th>

<td>${hobbies}</td>

</tr>

</table>

</body>

</html>