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**Term Work**

**On**

**Java Programming Language**

**(PCS 408)**

**Submitted to: Submitted by:**

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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

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**STUDENT LAB REPORT SHEET**

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**Mother’s Name ........................... Occupation ...................... Mob. No .......................**

**Section ............ Branch ............ Semester ............ Class Roll No ............ Grade A B C**

**Local Address ................................... Email ............................................ Marks 5 3 1**

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**PRACTICAL 1**

**Question:**

Create a class “Student” having following instance variables and methods. Instance variables: ID, Name, Branch and university Method: setDetails() and showDetails(). The setDetails() method sets the values of ID, Name, Branch and University. And showDetails() method shows the value of each field.

**Source Code:**

import java.util.Scanner;

public class Student {

String name;

int id;

String branch;

String university;

public void getDetails (String stName, int stId, String stBranch, String stUniversity) {

name = stName;

id = stId;

branch = stBranch;

university = stUniversity;

}

public void showDetails (String stName, int stId, String stBranch, String stUniversity) {

System.out.println("Name : " +stName);

System.out.println("Student Id. : " +stId);

System.out.println("Branch Name : " +stBranch);

System.out.println("University Name : " +stUniversity);

}

public static void main (String[] args) {

Scanner Sc = new Scanner(System.in);

Student St = new Student();

System.out.print("Enter the Student Name : ");

String stName = Sc.nextLine();

System.out.print("Enter the Student Id : ");

int stId = Sc.nextInt();

Sc.nextLine();

System.out.print("Enter the Student Branch : ");

String stBranch = Sc.nextLine();

System.out.print("Enter the University Name: ");

String stUniversity = Sc.nextLine();

St.getDetails(stName, stId, stBranch, stUniversity);

St.showDetails(stName, stId, stBranch, stUniversity);

}

}

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**PRACTICAL 2**

**Question:**

Write a Java Program to demonstrate the working of a banking-system

Instance variables: name, account\_no, amount

Instance methods: deposit(), withdraw(), checkBalance(), insert() and display().

Here we can deposit and withdraw amount from our account using deposit() and withdraw() methods respectively. The insert() method is to initialize state and display() method is to display state values.

**Source Code:**

import java.util.Scanner;

public class BankSystem {

String bankName, accountNo;

double amount;

public void insert(String name, String accountNumber, double balance) {

bankName = name;

accountNo = accountNumber;

amount = balance;

}

public double deposit(double depositAmount) {

amount = amount + depositAmount;

return amount;

}

public void withdraw(double withdrawalAmount) {

amount = amount - withdrawalAmount;

}

public void display() {

System.out.println();

System.out.println("Bank Name : " +bankName);

System.out.println("Account Number : " +accountNo);

System.out.println("Current Amount : " +amount);

}

public static void main(String[] args) {

Scanner Sc = new Scanner(System.in);

BankSystem Bs = new BankSystem();

System.out.print("Bank Name : ");

String name = Sc.nextLine();

System.out.print("Account Number : ");

String accountNumber = Sc.nextLine();

System.out.print("Original Amount : ");

double balance = Sc.nextDouble();

Bs.insert(name, accountNumber, balance);

Bs.display();

System.out.println();

System.out.print("Enter the amount for Deposit : ");

double depositAmount = Sc.nextDouble();

double ans = Bs.deposit(depositAmount);

Bs.display();

System.out.println();

System.out.print("Enter the amount for withdrawal : ");

double withdrawalAmount = Sc.nextDouble();

if (withdrawalAmount < ans) {

System.out.println("Money Available for withdrawal");

Bs.withdraw(withdrawalAmount);

Bs.display();

System.out.println();

}

else {

System.out.println("Insufficent Balance...");

}

}

}

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**PRACTICAL 3**

**Question:**

Write a program to sum two numbers. Here inputs are provided through command line argument.

**Source Code:**

public class sumCommand {

public static void main(String[] args) {

int a = Integer.parseInt(args[0]);

int b = Integer.parseInt(args[1]);

int sum = a + b;

System.out.println("Sum of Two number by Command Line : " +sum);

}

}

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**PRACTICAL 4**

**Question:**

Create class Employee with following attributes and methods ID, name, department, and salary. The setDetails() method sets the values of ID, name, department and salary. And showDetails() method shows the value of each field.

Note: (i) Values must be entered through Scanner class.

(ii) Use proper constructor

(iii) Use “this” reference variable to avoid ambiguity.

**Source Code:**

import java.util.Scanner;

public class Employee {

int id, salary;

String name, department;

public void getDetails(int Id, String employeeName, String dep, int sal) {

id = Id;

name = employeeName;

department = dep;

salary = sal;

}

public void showDetails() {

System.out.println();

System.out.println("Id : " +id);

System.out.println("Name : " +name);

System.out.println("Department : " +department);

System.out.println("Salary : " +salary);

}

public static void main(String[] args) {

Scanner Sc = new Scanner(System.in);

Employee Em = new Employee();

System.out.print("Enter the Employee Id : ");

int Id = Sc.nextInt();

Sc.nextLine();

System.out.print("Enter the Employee name : ");

String employeeName = Sc.nextLine();

System.out.print("Enter the Employee Department : ");

String dep = Sc.nextLine();

System.out.print("Enter the Employee Salary : ");

int sal = Sc.nextInt();

Em.getDetails(Id, employeeName, dep, sal);

Em.showDetails();

}

}

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**PRACTICAL 5**

**Question:**

Re-write program 1 with better memory management approach.

**Source Code:**

import java.util.Scanner;

public class StudentInfo {

String name;

int id;

String branch;

static String university = "GEHU";

public void getDetails (String name, int id, String branch) {

this.name = name;

this.id = id;

this.branch = branch;

}

public void showDetails (String name, int id, String branch, String university) {

System.out.println();

System.out.println("Name : " +name);

System.out.println("Student Id. : " +id);

System.out.println("Branch Name : " +branch);

System.out.println("University Name : " +university);

}

public static void main (String[] args) {

Scanner Sc = new Scanner(System.in);

StudentInfo St = new StudentInfo();

System.out.print("Enter the Student Name : ");

String name = Sc.nextLine();

System.out.print("Enter the Student Id : ");

int id = Sc.nextInt();

Sc.nextLine();

System.out.print("Enter the Student Branch : ");

String branch = Sc.nextLine();

St.getDetails(name, id, branch);

St.showDetails(name, id, branch, university);

}

}

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**PRACTICAL 6**

**Question:**

Apply following functions on the String "Java".

(i) Try to concat "Welcome" and write down your observation.

(ii) Find character at index 1

(iii) Find index of first 'a'.

(iv) Find index of second 'a'

(v) Compare "Java" to "JAVA"

(vi) Compare "Java" to "JAVA" ignoring the case

(vii) Find the index of first 'a' from last

**Source Code:**

public class JavaFun {

public static void main(String[] args) {

String s = "Java";

System.out.println("String after the Concatentation : " +s.concat("Welcome "));

System.out.println("Character at First Index : " +s.charAt(1));

System.out.println("Index of First 'a' : " +s.indexOf('a'));

System.out.println("Index of Second 'a' : " +s.indexOf('a', s.indexOf('a') + 1));

System.out.println("Compare 'Java' to 'JAVA' : " +s.compareTo("JAVA"));

System.out.println("Compare 'Java' to 'JAVA' ignoring Case : " +s.equalsIgnoreCase("JAVA"));

System.out.println("Index of First 'a' from last : " +s.lastIndexOf('a'));

}

}

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**PRACTICAL 7**

**Question:**

Apply following functions on StringBuffer object "HELLO"

(i) Append "Java"

(ii) Insert "Java" at index 1

(iii) Replace with "Java" with characters between index 1 to 2

(iv) Delete characters between index 1 and 2

(v) Reverse the string "HELLO"

**Source Code:**

class Append {

public void app() {

StringBuffer Sb = new StringBuffer("Hello");

Sb.append("Java");

System.out.println(Sb);

}

}

class Insert {

public void ins() {

StringBuffer Sb = new StringBuffer("Hello");

Sb.insert(1, "JAVA");

System.out.println(Sb);

}

}

class Replace {

public void rep() {

StringBuffer Sb = new StringBuffer("Hello");

Sb.replace(1, 3, "JAVA");

System.out.println(Sb);

}

}

class Delete {

public void del() {

StringBuffer Sb = new StringBuffer("Hello");

Sb.delete(1, 3);

System.out.println(Sb);

}

}

class Reverse {

public void rev() {

StringBuffer Sb = new StringBuffer("Hello");

Sb.reverse();

System.out.println(Sb);

}

}

public class Main {

public static void main(String[] args) {

Append Ap = new Append();

Ap.app();

Insert In = new Insert();

In.ins();

Replace Rp = new Replace();

Rp.rep();

Delete De = new Delete();

De.del();

Reverse Re = new Reverse();

Re.rev();

}

}

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**PRACTICAL - 8**

**Question:**

Create a class “Student” having following instance variables and methods.

Instance variables: ID, Name, Branch, city and university

While creating constructors with one, two, three, four and five arguments reuse the constructors by construction

chaining.

**Source Code:**

public class ConstructorChain {

int ID;

String name, city, branch, university;

ConstructorChain(int Id) {

ID = Id;

}

ConstructorChain(int Id, String nm) {

this(Id);

name = nm;

}

ConstructorChain(int Id, String nm, String bran) {

this(Id, nm);

branch = bran;

}

ConstructorChain(int Id, String nm, String bran, String City) {

this(Id, nm, bran);

city = City;

}

ConstructorChain(int Id, String nm, String bran, String City, String University) {

this(Id, nm, bran, City);

university = University;

}

public void Display() {

System.out.println("ID : " +ID);

System.out.println("Name : " +name);

System.out.println("Branch : " +branch);

System.out.println("City : " +city);

System.out.println("University : " +university);

}

public static void main(String[] args) {

ConstructorChain ConC = new ConstructorChain(20011940, "Nishan Kumar", "CSE", "Dehradun", "GEHU");

ConC.Display();

}

}

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**PRACTICAL - 9**

**Question:**

Create two-dimensional integer array and insert, search, and traverse this array.

Note: Use Scanner class to insert data.

**Source Code:**

import java.util.Scanner;

public class Arrays {

public static void main(String[] args) {

Scanner Sc = new Scanner(System.in);

System.out.print("Enter the Number of Rows : ");

int row = Sc.nextInt();

System.out.print("Enter the number of Column : ");

int column = Sc.nextInt();

int arr[][] = new int[row][column];

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

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

System.out.print("Enter the element : ");

int val = Sc.nextInt();

arr[i][j] = val;

}

}

System.out.println("After Enter the element in Array : ");

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

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

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

}

System.out.println(" ");

}

System.out.print("Enter the element to be Search : ");

int num = Sc.nextInt();

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

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

if (arr[i][j] == num) {

System.out.println("Element Found : " +num);

break;

}

}

}

}

}

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PRACTICAL - 10

**Question:**

Create a jagged array having three rows. Where 1st row contains 3 columns, 2nd row contains 4 columns and 3rd row contains 2 columns. Insert and traverse it.

**Source Code:**

import java.util.Scanner;

public class Jagged {

public static void main(String[] args) {

Scanner Sc = new Scanner(System.in);

int arr[][] = new int[3][];

arr[0] = new int[3];

arr[1] = new int[5];

arr[2] = new int[6];

for (int i = 0; i < arr.length; ++i) {

for (int j = 0; j < arr[i].length; ++j) {

System.out.print("Enter the Value : ");

int val = Sc.nextInt();

arr[i][j] = val;

}

}

System.out.println("Jagged Array : ");

for (int i = 0; i < arr.length; ++i) {

for (int j = 0; j < arr[i].length; ++j) {

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

}

System.out.println(" ");

}

}

}

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**PRACTICAL – 11**

**Question:**

Create a class “Shape” having area () method to calculate area. Overload the area () method for shapes like triangle, rectangle, and circle.

**Source Code:**

import java.util.Scanner;

public class Shape {

int length, breadth, side;

double radius;

public void Area(int length, int breadth) {

this.length = length;

this.breadth = breadth;

int area = (this.length) \* (this.breadth);

System.out.println("The area of Rectangle : " +area);

System.out.println(" ");

}

public void Area(int side) {

this.side = side;

int area = (this.side) \* (this.side);

System.out.println("The area of Square : " +area);

System.out.println(" ");

}

public void Area(double radius) {

this.radius = radius;

double area = (3.14 \* (this.radius) \* (this.radius));

System.out.println("The area of Circle : " +area);

}

public static void main(String[] args) {

Scanner Sc = new Scanner(System.in);

Shape Sp = new Shape();

System.out.print("Enter the length of Rectangle : ");

int length = Sc.nextInt();

System.out.print("Enter the breadth of Rectangle : ");

int breadth = Sc.nextInt();

Sp.Area(length, breadth);

System.out.print("Enter the Side Of Square : ");

int side = Sc.nextInt();

Sp.Area(side);

System.out.print("Enter the radius of Circle : ");

double radius = Sc.nextDouble();

Sp.Area(radius);

}

}

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**PRACTICAL - 12**

**Question:**

Create a class “Bank” having method getRateOfInterest(). Create child classes as HDFC, SBI and PNB and override getRateOfInterest() and return interest rates as 4.0, 4.5 and 5% correspondingly. Use concept of Upcasting to implement this scenario.

**Source Code:**

class Bank {

double getRateOfInterest() {

double rateOfInterest = 2.0;

return rateOfInterest;

}

}

class Hdfc extends Bank {

double getRateOfInterest() {

double rateOfInterest = 4.0;

return rateOfInterest;

}

}

class Sbi extends Bank {

double getRateOfInterest() {

double rateOfInterest = 4.5;

return rateOfInterest;

}

}

class Pnb extends Bank {

double getRateOfInterest() {

double rateOfInterest = 5.0;

return rateOfInterest;

}

}

class Interests {

public static void main(String[] args) {

// Upcasting

Bank Bn = new Hdfc();

System.out.print("Rate Of Interest Of HDFC Bank : " +Bn.getRateOfInterest());

System.out.println();

Bn = new Sbi();

System.out.print("Rate Of Interest Of SBI Bank : " +Bn.getRateOfInterest());

System.out.println();

Bn = new Pnb();

System.out.print("Rate Of Interest Of PNB Bank : " +Bn.getRateOfInterest());

System.out.println();

}

}

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**Practical – 13**

**Question:**

Create a package pack1 having one class C1 and one interface I1. Class C1 has

two methods int sum (int, int) and int sub (int, int). The I1 has one method int division (int, int). Create another package pack2 having class C2. Reuse C1 and I1 in C2 and show the results.

Note: Use appropriate Access Modifiers as required.

**Source Code:**

package p1;

public class C1 {

public int sum(int x,int y) {

return(x+y);

}

public int sub(int a, int b) {

return(a-b);

}

}

package p1;

public interface I1 {

int div(int a ,int b);

}

package p2;

import p1.\*;

import java.util.\*;

public class C2 implements I1 {

public int div(int a ,int b) {

if(b!=0) {

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}

else {

}

}

return(a/b);

return(-1);

public static void main(String args[]) {

Scanner in=new Scanner(System.in);

C1 d=new C1();

C2 f=new C2();

System.out.println("Enter 2 numbers");

int a=in.nextInt();

int b=in.nextInt();

System.out.println("Sum of a and b:"+d.sum(a,b));

System.out.println("Subtraction of a and b:"+d.sub(a,b));

System.out.println("Division of a and b:"+f.div(a,b));

}

}