20MCA132 - OBJECT ORIENTED PROGRAMMING LAB

LAB CYCLE 1 & 2

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S2 MCA

LAB CYCLE 1

PROBLEM: 1

AIM : Define a class 'product' with data members pcode, pname and price. Create 3 objects of the class and find the product having the lowest price.

ALGORITHM :

Step 1: Start.

Step 2: Define a class having name Product and members as pcode,pname and price.

Step 3: Declare three objects in the class and add the values of each data members into objects.

Step 4: Using if condition check which object has the lowest price and print it.

Step 5: Stop.

PROGRAM CODE :

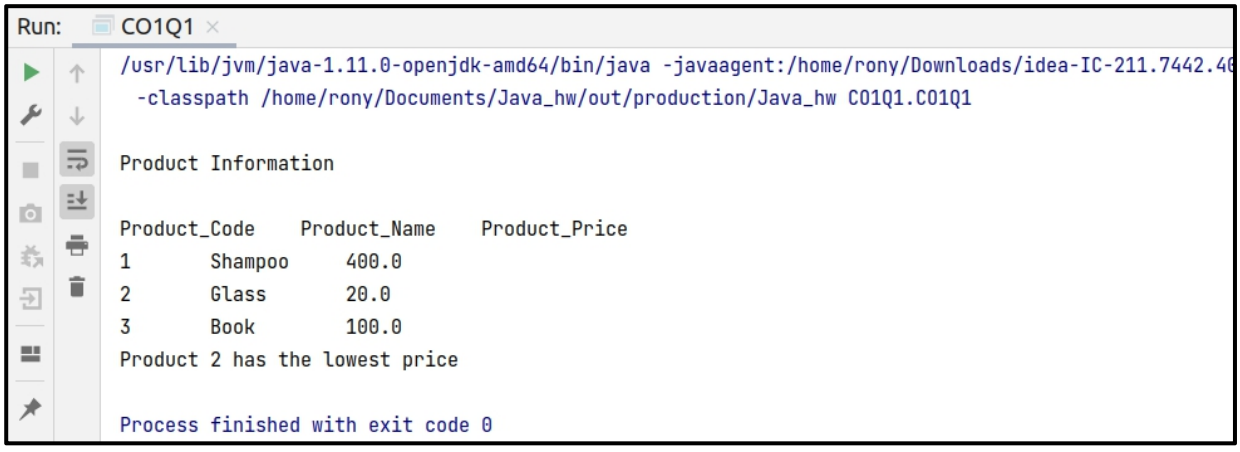
CO1Q1.java

```
package CO1Q1;

//Define a class 'product' with data members pcode, pname and price. Create 3 objects of
// the class and find the product having the lowest price.
public class CO1Q1 {
    int pcode;
    String pname;
    double price;
    CO1Q1(int code, String name,double rate){
        pcode=code;
        pname=name;
        price=rate;
    }
    void display(){
        System.out.println(pcode+"\t\t"+pname+"\t\t"+price);
    }
    static void lowest(double p1, double p2, double p3){
        if(p1<p2&&p1<p3)
        {
            System.out.println("Product 1 has the lowest price");
        }
```

```
        else if(p2<p1&&p2<p3){
            System.out.println("Product 2 has the lowest price");
        }
        else if(p3<p1&&p2>p3)
        {
            System.out.println("Product 3 has the lowest price");

        }
    }
    public static void main(String[] args) {
        CO1Q1 obj1=new CO1Q1(1,"Shampoo",400);
        CO1Q1 obj2=new CO1Q1(2,"Glass",20);
        CO1Q1 obj3=new CO1Q1(3,"Book",100);
        System.out.println("\nProduct
Information\n\nProduct_Code\tProduct_Name\tProduct_Price");
        obj1.display();
        obj2.display();
        obj3.display();
        lowest(obj1.price,obj2.price,obj3.price);
    }

}
```

RESULT : The above program is successfully executed and obtained the output

OUTPUT :



PROGRAM: 2

AIM : Read 2 matrices from the console and perform matrix addition.

ALGORITHM :

Step 1: Start.

Step 2: Define a class having name AddMatrix.

Step 3: Read row number(m),column number (n) and initialize the double dimensional arrays mat1[][],mat2[][],res[][] with same row number ,column number.

Step 4: Store the first matrix elements into the two-dimensional array matrix mat1[][] using two for loops. i indicates row number, j indicates column index. Similarly second matrix elements in to mat2[][].

Step 5: Add the two matrices using for loop.

for i=0 to i<m

for j=0 to j<n

mat1[i][j] + mat2[i][j] and store it in to the matrix res[i][j] .

Step 6: Print sum of matrices res[i][j].

Stop 7: Stop.

PROGRAM CODE :

CO1Q2.java

```
package CO1Q2;
import java.util.Scanner;
public class CO1Q2 {
   public static void main(String args[])
   {
      int row, col,i,j;
      Scanner in = new Scanner(System.in);

      System.out.println("Enter the number of rows : ");
      row = in.nextInt();

      System.out.println("Enter the number columns : ");
      col = in.nextInt();

      int mat1[][] = new int[row][col];
      int mat2[][] = new int[row][col];
```

```
        int res[][] = new int[row][col];
        System.out.println("Enter the elements of matrix 1  : ");
        for ( i= 0 ; i < row ; i++ )
        {
           for ( j= 0 ; j < col ;j++ )
              mat1[i][j] = in.nextInt();
        }
        System.out.println("Enter the elements of matrix 2  : ");
        for ( i= 0 ; i < row ; i++ )
        {
           for ( j= 0 ; j < col ;j++ )
              mat2[i][j] = in.nextInt();
        }
        for ( i= 0 ; i < row ; i++ )
           for ( j= 0 ; j < col ;j++ )
              res[i][j] = mat1[i][j] + mat2[i][j] ;

        System.out.println("Sum of matrices : ");

        for ( i= 0 ; i < row ; i++ )
        {
           for ( j= 0 ; j < col ;j++ )
              System.out.print(res[i][j]+"\t");
           System.out.println();
        }
     }
}
```

RESULT : The above program is successfully executed and obtained the output

OUTPUT :

PROGRAM: 3

AIM : Add complex numbers

ALGORITHM :

Step 1: Start.

Step 2: Define a class having name ComplexNumber and data members are real and imaginary number.

Step 3: Define a function ComplexNumber and add values to variables.

Step 4 : Define a function ComplexNumber sum to add complex number using 3rd ComplexNumber object and return the value.

Step 5: Print the sum value.

Step 6: Stop.

PROGRAM CODE :

CO1Q3.java

```
package CO1Q3;

//Add complex numbers
public class CO1Q3 {
    int r;
    int i;
    CO1Q3(int real,int img){
        r=real;
        i=img;
    }
    void display(){
        System.out.println(r+"+"+i+"i");
    }
    static void add(int r1,int i1,int r2,int i2 ){
        r1=r1+r2;
        i1=i1+i2;
        System.out.println("After Addition = "+r1+"+"+i1+"i");
    }
    public static void main(String[] args) {
        // Scanner sc =new Scanner(System.in);
        // String firstComplex=sc.nextLine();
        // String[] ar=firstComplex.split("[-+i]");
        // String secondComplex=sc.nextLine();
        // String[] ar2=secondComplex.split("[-+i]");
        CO1Q3 first=new CO1Q3(5,4);
```

```
        CO1Q3 second=new CO1Q3(7,9);
        System.out.println("Complex Numbers are:");
        first.display();
        second.display();
        add(first.r,first.i,second.r,second.i);
    }
}
```

RESULT : The above program is successfully executed and obtained the output

OUTPUT :

PROGRAM: 4

AIM : Read a matrix from the console and check whether it is symmetric or not.

ALGORITHM :

Step 1: Start.

Step 2 : Read row number,column number and initialize the double dimensional array with same row number ,column number.

Step 3 : Store the first matrix elements into the two-dimensional array matrix using two for loops. i indicates row number, j indicates column index.

Step 4: Check whether the matrix is symmetric or not.

Step 5: Print the symmetric matrix or if not.

Step 6: Stop.

PROGRAM CODE :

CO1Q4.java	package CO1Q4;
	import java.util.Scanner;
	public class CO1Q4
	{
	public static void main(String[] args)
	{
	Scanner sc = new Scanner(System.in);
	System.out.println("Enter the no. of rows : ");
	int rows = sc.nextInt();
	System.out.println("Enter the no. of columns : ");
	int cols = sc.nextInt();
	int matrix[][] = new int[rows][cols];
	System.out.println("Enter the elements :");
	for (int i = 0; i < rows; i++)
	{
	for (int j = 0; j < cols; j++)
	{
	System.out.println("Input number for matrix position ["+(i+1)+"]["+(j+1)+"] : ");
	matrix[i][j] = sc.nextInt();
	}
	}
	System.out.println("Printing the input matrix :");
	for (int i = 0; i < rows; i++)
	{
	for (int j = 0; j < cols; j++)
	{

```
                System.out.print(matrix[i][j]+"\t");}
            System.out.println();}
        //Checking the input matrix for symmetric
        if(rows != cols)
        {
            System.out.println("The given matrix is not a square matrix, so it can't
be symmetric."); }
        else {
            boolean symmetric = true;

            for (int i = 0; i < rows; i++){
                for (int j = 0; j < cols; j++) {
                    if(matrix[i][j] != matrix[j][i])
                    {
                        symmetric = false;
                        break;}}}
            if(symmetric){
                System.out.println("The given matrix is symmetric..."); }
            else {
                System.out.println("The given matrix is not symmetric...");}}
        sc.close();
    }}
```

RESULT : The above program is successfully executed and obtained the output

OUTPUT :

PROGRAM: 5

AIM : Create CPU with attribute price. Create inner class Processor (no. of cores, manufacturer) and static nested class RAM (memory, manufacturer). Create an object of CPU and print information of Processor and RAM.

ALGORITHM :

Step 1: Start.

Step 2: Define a class cpu with data member price and class processor.

Step 3: Class processor contain data members no_cores,manufacturer and a nested class RAM.

Step 4: class RAM contain memory and manufacturer as data members.

Step 5: Create objects in corresponding classes and display it's details.

Step 6: Stop.

PROGRAM CODE :

CO1Q5.java

```
package CO1Q5;
public class CO1Q5{
    int price;
    static class processor{
        int cores;
        String producer;
        processor(int noC, String manu){
            cores=noC;
            producer=manu;
        }
        void display(){
            System.out.println("\nProcessor info");
            System.out.println("No. of Cores = "+cores);
            System.out.println("Manufacturer = "+producer+"\n");
        }
    }
    class ram{
        int mem;
        String manuf;
        ram(int memory,String producer ){
            mem=memory;
            manuf=producer;
        }
        void display(){
```

```
            System.out.println("\nRAM info");
            System.out.println("Memory = "+mem);
            System.out.println("Manufacturer = "+manuf+"\n");
        }}
    public static void main(String[] args) {
        CO1Q5.processor obj1= new  CO1Q5.processor(8,"Intel");
        CO1Q5 obj2 = new  CO1Q5();
        CO1Q5.ram obj3 = obj2.new ram(8,"Samsung");
        obj1.display();
        obj3.display();

    }
}
```

RESULT : The above program is successfully executed and obtained the output

OUTPUT :

LAB CYCLE 2

PROGRAM: 6

AIM : . Program to Sort strings.

ALGORITHM :

Step 1: Start

Step 2: Select the first element of the list (i.e., Element at first position in the list).

Step 3: Compare the selected element with all the other elements in the list.

Step 4: In every comparision, if any element is found smaller than the selected element (for Ascending order), then both are swapped.

Step 5: Repeat the same procedure with element in the next position in the list till the entire list is sorted.

Step 6: Stop

PROGRAM CODE :

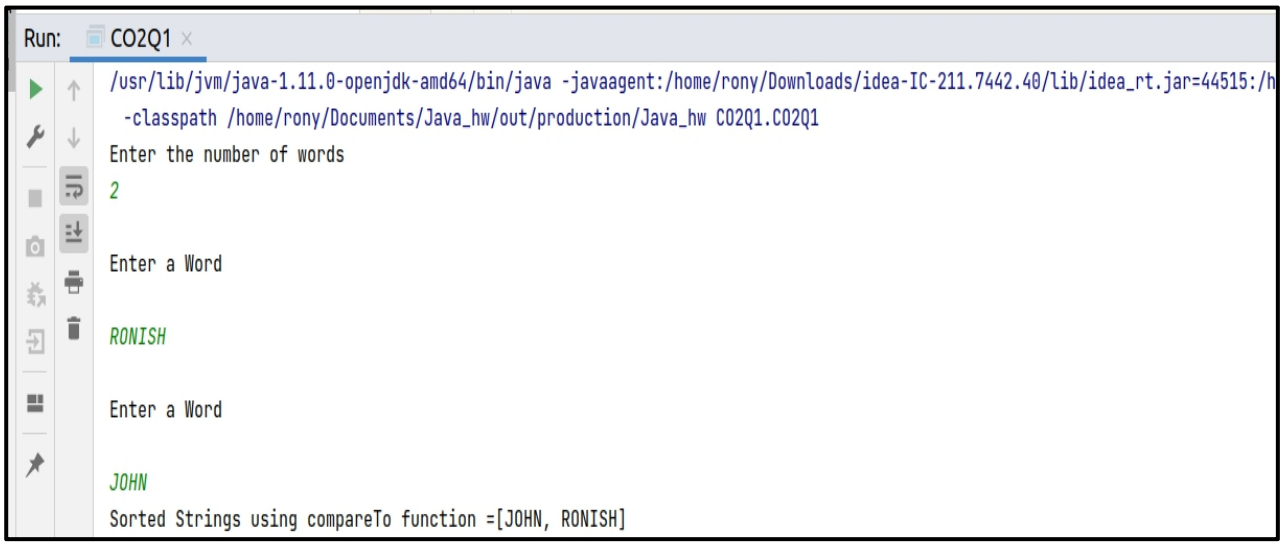
CO2Q1.java

```
package CO2Q1;
//. Program to Sort strings

import java.util.Scanner;

import java.util.Arrays;

public class CO2Q1 {

    public static void main(String[] args) {
        int i,j;
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the number of words");

        int num=sc.nextInt();

        String word[]=new String[num];

        sc.nextLine();
        for( i=0;i<num;i++){
            System.out.println("\nEnter a Word\n");
            word[i]=sc.nextLine();
        }
```

```
        for( i=0;i<num-1;i++){
            for( j=i+1;j<num;j++){
                if(word[i].compareTo(word[j])>0){
                    String temp = word[i];
                    word[i]=word[j];
                    word[j]=temp;
                }
            } }
        System.out.println("Sorted Strings using compareTo function
="+Arrays.toString(word));
        System.out.println(word);
    }
    }
```

RESULT : The above program is successfully executed and obtained the output

OUTPUT :



PROGRAM: 7

AIM : Search an element in an array.

ALGORITHM :

Step 1: Start

Step 2: Check each element in the given list with the string provided by the user.

Step 3: If string is found, display the position of the string found, else display string not found.

Step : Stop

PROGRAM CODE :

CO2Q2.java

```
package CO2Q2;
import java.util.Scanner;

public class CO2Q2 {
   public static void main(String[] args) {
      int i,j,x=0;
      boolean state = false;
      Scanner sc = new Scanner(System.in);
      System.out.println("Enter the number of elemets in array");
      int num=sc.nextInt();
      String word[]=new String[num];
      sc.nextLine();
      for( i=0;i<num;i++){
         System.out.println("\nEnter the element");
         word[i]=sc.nextLine();
      }
      System.out.println("Enter the element to Search");
      String search = sc.nextLine();
      for( i=0;i<num;i++){
         if(word[i].equals(search)){
            x = i;
            state = true;
         }
      }
      if(state){
         System.out.println("Element found at  position = "+x);
      }
      else{
         System.out.println("Element found not found");
```

	} } }

RESULT : The above program is successfully executed and obtained the output

OUTPUT :

PROGRAM: 8

AIM : Perform string manipulations

ALGORITHM :

Step 1: Start

Step 2: Take the strings provided by the user and concatenate them.

Step 3: Display the combined string with lower case.

Step 3: Display the combined string with upper case.

Step 4: Display the combined string after replacing all the ‘s’ & ‘S’ characters with ‘$’ character.

Step 5: Stop

PROGRAM CODE :

CO2Q3.java	package CO2Q3;
	
	//String Manipulation
	import java.util.Scanner;
	public class CO2Q3{
	public static void main(String[] args) {
	System.out.println("Enter The String");
	Scanner sc = new Scanner(System.in);
	String str1 = sc.nextLine();
	System.out.println("Length of String = "+str1.length());
	System.out.println("Character at First position = "+str1.charAt(1));
	System.out.println("String Contains 'Col'
	sequence :"+str1.contains("Col"));
	System.out.println("String ends with e : "+str1.endsWith("e"));
	System.out.println("Replace'col' with 'kol' :
	"+str1.replaceAll("Col","kol"));

```
        System.out.println("LOWERCASE : "+str1.toLowerCase());
        System.out.println("UPPERCASE : "+str1.toUpperCase());
    }
}
```

RESULT : The above program is successfully executed and obtained the output

OUTPUT :

PROGRAM: 9

AIM : Program to create a class for Employee having attributes eNo, eName eSalary. Read n employ information and Search for an employee given eNo, using the concept of Array of Objects.

ALGORITHM :

Step 1: Start

Step 2: Search the ‘eNo’ attribute of the list of Employee Objects for the ‘eNo’ provided by the user.

Step 3: If user provided ‘eNo’ is found inside the Employee object list, display the details of the corresponding employee.

Step 4: Stop

PROGRAM CODE :

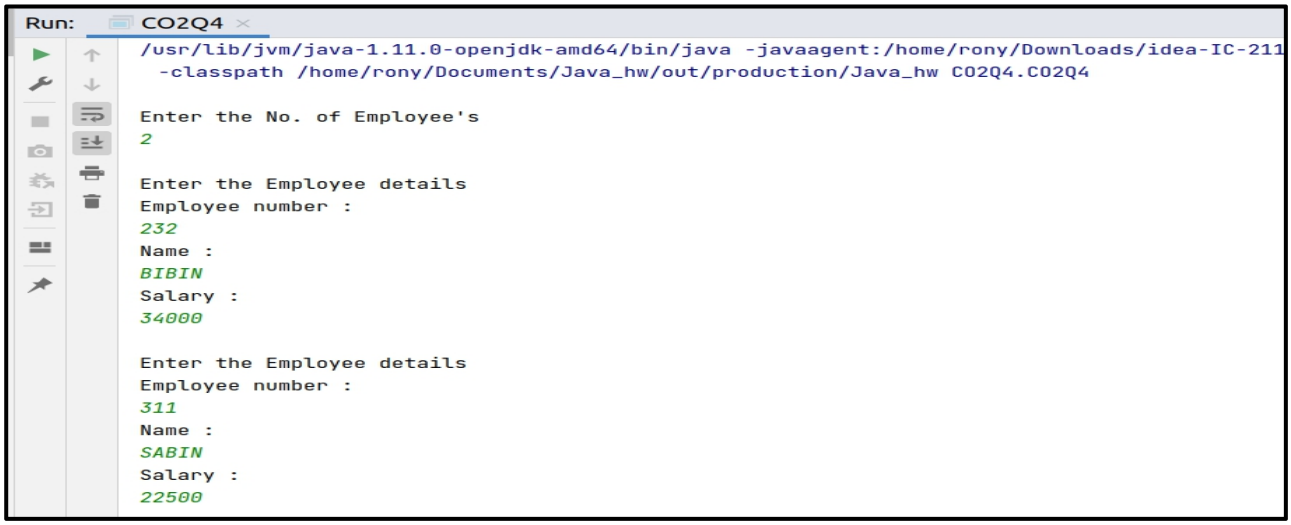
CO2Q4.java

```
package CO2Q2;
import java.util.Scanner;

public class CO2Q2 {
    public static void main(String[] args) {
        int i,j,x=0;
        boolean state = false;
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the number of elemets in array");
        int num=sc.nextInt();
        String word[]=new String[num];
        sc.nextLine();
        for( i=0;i<num;i++){
            System.out.println("\nEnter the element");
            word[i]=sc.nextLine();
```

```
        }
        System.out.println("Enter the element to Search");
        String search = sc.nextLine();
        for( i=0;i<num;i++){
            if(word[i].equals(search)){
                x = i;
                state = true;
            }
        }
        if(state){
            System.out.println("Element found at  position = "+x);
        }
        else{
            System.out.println("Element found not found");
} }}
```

RESULT : The above program is successfully executed and obtained the output

OUTPUT :




Run:
CO2Q4
/usr/lib/jvm/java-1.11.0-openjdk-amd64/bin/java -javaagent:/home/rony/Downloads/idea-IC-211
-classpath /home/rony/Documents/Java_hw/out/production/Java_hw CO2Q4.CO2Q4
Enter the No. of Employee's
2
Enter the Employee details
Employee number :
232
Name :
BIBIN
Salary :
34000
Enter the Employee details
Employee number :
311
Name :
SABIN
Salary :
22500