ST. JOHN'S SCHOOL UPSIDC, FIROZABAD

PROGRAMMING IN JAVA

SUBJECT: COMPUTER APPLICATIONS

SESSION: 2023-2024

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CLASS : X SECTION : A

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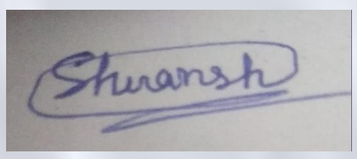

Shivansh Dubey

CERTIFICATE

This is to certify that Shivansh Dubey

student of Class X A

has successfully completed his/her Project in Computer

on the topic “Programming in java”

under the guidance of Mr Krishnakant Upadhyay.

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Principal	External Examiner	Internal Examiner

Program 1

Design a class Railway Ticket with following description :

Instance Variables / Data Members :

String name : *To store the name of the customer*
String coach : *To store the type of coach customer wants to travel*
long mobno : *To store customer's mobile number*
int amt : *To store basic amount of ticket*
int totalamt : *To store the amount to be paid after updating the original amount*

Member Methods :

void accept ( ) — *To take input for name, coach, mobile number and amount*
void update ( ) — *To update the amount as per the coach selected*

Type Of Coach	Amount
First_AC	₹700
Second_AC	₹500
Third_AC	₹250
Sleeper class	NONE

Void display ( ) — *to fisplay all details of customer such as name, coach,* totalamount and mobile number

Write a main method to create an object of the class and call the above member methods

```
import java.util.Scanner;
class RailwayTicket1{
    String name;
    String coach;
    long mobno;
    int amt;
    int totalamt;
```

```
void accept(){
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter your Name  \t\t");
        name=sc.nextLine();
        System.out.print("Enter your Coach
\t\t");                    coach=sc.nextLine();
        System.out.print("Enter your Mobile Number\t");
        mobno=sc.nextLong()
        System.out.print("Enter your Amount\t");
        amt=sc.nextInt();
        sc.close();
}
void update(){
         if(this.coach.equals("First_AC")){
               totalamt=amt+700;
         }
         else if(this.coach.equals("Second_AC")){
               totalamt=amt+500;
         }
         else if(this.coach.equals("Third_AC")){
               totalamt=amt+250;
         }
}
void display(){
        System.out .println("\n\n\n\n\n\n\tName =\t"+name);
        System.out.println("\tCoach =\t"+coach);
        System.out.println("\tMobile no.= "+mobno);
        System.out.println("\tTotal amount to paid"+totalamt+"");
  }
  void main(){
        RailwayTicket1 RT=new RailwayTicket1();
        RT.accept();
        RT.update();
        RT.display();
  }
}
```

Program 2

A private Cab service company provides service within the city at the following rates:

	AC Car	Non-AC Car
Up to 5 km	₹150/-	₹120/-
Beyond 5 km	₹10/-per km	₹08/-per km

Design a class CabService with the following description:

Member Variables /Data Members:

String car_type - *To store the type of car (AC or NON AC)*
double km - *To store the kilometer travelled*
double bill - *To calculate and store the bill amount*

Member Methods :

CabService() - *Default constructor to initialize data members. String data members to '' '' and double data members to 0.0.*
void accept () - *To accept car_type and km (using Scanner class only).*
void calculate () - *To calculate the bill as per the rules given above.*
void display() - *To display the bill as per the following format:*

CAR TYPE:
KILOMETER TRAVELLED:
TOTAL BILL:

Create an object of the class in the main method and invoke the member methods.

```
import java.util.Scanner;
class CabService2{
    String car_type;
    double km;
    double bill;
    CabService2(){
        car_type="";
        km=0.0;
        bill=0.0;
    }
    void accept(){
        Scanner sc=new Scanner(System.in);
        System.out.print("Please enter the type of car
and                                    the kilometers it's used:");
        car_type=sc.nextLine();
        km=sc.nextDouble();
        sc.close();
    }
    void calculate(){
        if(car_type.equals("AC")){
            if(km>0.0 && km<5.0){
                bill=150.0;
            }
            else{
                bill=((km-5.0)*10);
                bill+=150;
            }
        }
        else{
            if(km>0.0 && km<5.0){
                bill=120.0;
            }
            else{
                bill=120.0+((km-5.0)*8);
            }
        }
    }
```

```
void display(){
        System.out.println("CAR  TYPE:"+car_type);
        System.out.println("KILOMETERS  TRAVELLED:"+km);
        System.out.println("TOTAL BILL:"+bill);
 }
 public static void main(String[] args) {
        CabService2 obj=new CabService2();
        obj.accept();
        obj.calculate();
            obj.display();
      }
}
```

Program 3

Design a class to overload a function volume() as follows :

(i) *double volume (double R) — with radius (R) as an argument, returns the volume of sphere using the formula.*

$V = 4/3 \times 22/7 \times R^3$

(ii) *double volume (double H, double R) – with height(H) and radius(R) as the arguments, returns the volume of a cylinder using the formula.*

$V = 22/7 \times R^2 \times H$

(iii) *double volume (double L, double B, double H) – with length(L), breadth(B) and Height(H) as the arguments, returns the volume of a cuboid using the formula.*

```
class Overload3{
   double volume(double R){
      double V=4/3*22/7*R*R*R;
      return V;
   }
   double volume(double H,double R){
      double V=22/7*R*R*H;
      return V;
   }
   double volume(double L,double B,double H){
      double V=L*B*H;
      return V;
   }
}
```

Program 4

Write a program to accept a number and check and display whether it is a spy number or not.
A number is spy if the sum of its digits equals the product of its digits. For example, consider the number 1124.
Sum of its digits : 1 + 1 + 2 + 4 = 8
Product of its digits : 1 * 1 * 2 * 4 = 8

```
import java.util.Scanner;
class Spy4{
    static boolean check_spy(int n){
        int prod=1,sum=0,temp;
        while(n>0){
            temp=n%10;
            prod*=temp;
            sum+=temp;
            n/=10;
        }
        if(prod==sum){
            return true;
        }else{
            return false;
        }
    }
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter the number:");
        int n=sc.nextInt();
        if(check_spy(n)){
            System.out.println("The number is a spy number");
        }else{
            System.out.println("the number is not a spy number");
        }
    }
}
```

Program 5

Design a class named 'Showroom' with the following description:

Instance Variable / Data Members :

String name - *To store the name of the customer*
long mobno - *To store the mobile number of the customer*
double cost - *To store the cost of the items purchased*
double dis - *To store the discount amount*
double amount - *To store the amount to be paid after discount*

Member Methods :

ShowRoom() - *Default constructor to initialise data members*
void input() - *To input customers name, mobile number, cost*
Void calculate() - *To calculate discount on the cost of purchased items ,based on the following criteria*

COST	DISCOUNT (in percentage)
Less than or equal to ₹10000	5%
More than ₹10000 and less than ₹20001	10%
More than ₹20000 and less than ₹35001	15%
More than ₹35000	20%

Void display() - *To display customer name, mobile number, amount to be paid after discount*

Write a main method to create an object of the class and call the above member methods

```
import java.util.Scanner;
public class ShowRoom5 {
    String name;
    long mobno;
    double cost;
    double dis;
    double amount;
    ShowRoom5(){
    name="";
    mobno=0;
    cost=0.0;
    dis=0.0;
    amount=0.0;
}
void input(){
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter the Name,Mobile
number                    and the cost to be paid by the customer");
        name=sc.nextLine();
        mobno=sc.nextLong();
        cost=sc.nextDouble();
        sc.close();
    }
    void calculate(){
        if(cost<=10000){
            dis=5.0;
        }else if(cost<=20000){
            dis=10.0;
        }else if(cost<=35000){
            dis=15.0;
        }else{
            dis=20.0;
        }amount=cost/100*(100-dis);
}
```

```
    void display(){
        System.out.println("\n\n\tCustomer's Info");
        System.out.println("name= "+name);
        System.out.println("Mobile Number= "+mobno);
        System.out.println("Amount to be paid= "+amount);
    }
    public static void main(String[] args) {
        ShowRoom5 obj=new ShowRoom5();
        obj.input();
        obj.calculate();
        obj.display();
    }
}
```

Program 6

Define a class called with the following specifications:

Class name: *Eshop*

Member variables:

String name : *name of the item purchased*

double price : *Price of the item purchased*

Member methods:

void accept() : *Accept the name and the price of the item using the methods of Scanner class.*

void calculate(): *To calculate the net amount to be paid by a customer, based on the following criteria:*

PRICE	DISCOUNT
₹1000 - ₹25000	5.0%
₹25001 - ₹57000	7.5%
₹57001 - ₹100000	10.0%
More than 100000	15.0%

void display(): To display the name of the item and the net amount to be paid.

Write the main method to create an object and call the above methods.

```
import java.util.Scanner;
class Eshop6{
    String name;
    double price;
    void accept(){
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter your name");
        name=sc.nextLine();
```

Program 7

Design a class to accept a 3 digit number and check whether it is a duck number or not.

Note: *A number is a check number if it has zero in it*

```
import java.util.Scanner;
public class Duck7 {
    static int num;
    static void check_duck(){
        if(num>999){
            System.out.println("Invalid");
            return;
        }
    while(num!=0){
        if(num%10==0){
            System.out.println("Duck Number");
            return;
        }
        num/=10;
    }
    System.out.println("Not A Duck Number");
}
public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the number");
        num=sc.nextInt();
        check_duck();
        sc.close();
    }
}
```

```
        System.out.println("Enter the price");
        price=sc.nextDouble();
        sc.close();
    }
    void calculate(){
        double dis;
        if(price<=1000){
          return;
        }else if(price<=25000){
          dis=5.0;
        }else if(price<=57000){
          dis=7.5;
        }else if(price<=100000){
          dis=10.0;
        }else{
            dis=15.0;
        }
        price=(price/100)*(100-dis);
    }
    void display(){
      System.out.println("Name : "+name);
      System.out.println("Total amount to be paid : "+price);
    }
    public static void main(String[]args){
        Eshop6 obj=new Eshop6();
        obj.accept();
         obj.calculate();
        obj.display();
    }
}
```

Program 8

Define a class to overload the method display as follows:

void display(): To print the following format using nested loop

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5

void display(int n): To print the square root of each digit of the given number

Example: n = 4329
output – 3.0
1.414213562
1.732050808
2.0

```
public class Overload8 {
    void display(){
        for (int i=1;i<=5;i++){
            for(int j=1;j<=i;j++)
                System.out.print(j);
            System.out.println();
        }
    }
    void display(int n){
        while(n!=0){
            System.out.println(Math.sqrt(n%10));
            n/=10;
        }
    }
}
```

Program 9

Define a class to accept 10 characters from a user. Using bubble sort technique arrange them in ascending order. Display the sorted array and original array.

```
import java.util.Scanner;
public class ArrSort9 {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        char ch[]=new char[10];
        System.out.println("enter 10 characters");
        for(int i=0;i<10;i++)
        ch[i]=sc.nextLine().charAt(0);
        char temp;
        System.out.println("Unsorted Array");
for(int i=0;i<10;i++)
    System.out.print(ch[i]+"\t");
for(int i=0;i<9;i++){
    for(int j=0;j<9-i;j++){
        if(ch[j]>ch[j+1]){
            temp=ch[j];
            ch[j]=ch[j+1];
            ch[j+1]=temp;
            }
        }
    }
        System.out.println("\nSorted array");
        for(int i=0;i<10;i++)
        System.out.print(ch[i]+"\t");
        sc.close();
    }
}
```

Program 10

Define a class to accept a String and print the number of digits, alphabets and special characters in the string.

Example: **S = "KAPILDEV@83"**

Output: Number of digits – 2
Number of Alphabets – 8
Number of Special characters – 1

```
import java.util.Scanner;
public class Character10 {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the String");
        String str=sc.nextLine();
        int d=0,a=0,s=0,o=0;
    for(int i=0;i<str.length();i++){
        char ch=str.charAt(i);
        if(ch<58&&ch>47){
            d++;
        }else if(ch<91&&ch>64||ch<123&&ch>96){
            a++;
        }else if(ch<32&&ch>=0){
            o++;
        }else{
                s++;
            }
        }
        System.out.println("Number of Digits : "+d);
        System.out.println("Number of Alphabets : "+a);
        System.out.println("Number of Special Characters : "+s);
        System.out.println("Other Characters : "+o);
        sc.close();
    }
}
```

Program 11

Define a class to accept a string, and print the characters with the uppercase and lowercase reversed, but all the other characters should remain the same as before.

EXAMPLE:

INPUT : **WelCoMe_2022**

OUTPUT : **wELcOmE_2022**

```
import java.util.Scanner;
public class ReverseCase11 {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        String str=sc.nextLine();
        for(int i=0;i<str.length();i++){
            char ch=str.charAt(i);
            if(ch>=65&&ch<=90){
            ch+=32;
            }else if(ch>=97&&ch<=122){
                ch-=32;
            }
            System.out.print(ch);
        }
        sc.close();
    }
}
```

Program 12

Write a program to search for an integer value input by the user in the sorted list given [15] below using binary search technique. If found display "Search Successful" and print the element, otherwise display "Search Unsuccessful“ (31, 36, 45, 50, 60, 75, 86,90)

```
import java.util.Scanner;
public class  ArrSearch12{
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        int arr[]={31,36,45,50,60,75,86,90};
        System.out.println("Enter the number to be searched");
        int num=sc.nextInt();
        int l=0,u=7,m;
        while(l<u){
            m=l+u/2;
            if(num==arr[m]){
                System.out.println("Search Successful at index "+m);
                System. exit(0);
            }else if(num<arr[m]){
                u=m;
            }else if(num>arr[m]){
                l=m;
            }
        }
        System.out.println("Search Unsuccessful");
        sc.close();
    }
}
```

Program 14

Write a program to input a sentence and convert it into uppercase and count and display the total number of words starting with a letter 'A'. Example:

Input: ADVANCEMENT AND APPLICATION OF INFORMATION TECHNOLOGY ARE EVER CHANGING.

Output: Total number of words starting with letter A='4'

```
import java.util.Scanner;
public class SentenceAnalyzer {
    public static void main(String[] args) {
        Scanner obj=new Scanner(System.in);
        System.out.print("Enter a sentence: ");
        String sentence=obj.nextLine();
        sentence = sentence.toUpperCase();
        int count = 0;
        for (int i = 0; i < sentence.length(); i++) {
            if (sentence.charAt(i) == ' '||i==0) {
                if(sentence.charAt(i+1)=='A')
                  count++;
            }
        }
        System.out.println("Total number of letters starting with A
                                                    : " + count);
        obj.close();
    }
}
```

Program 13

Write a program to input a sentence and convert it into uppercase and display each word in a separate line.

Example: Input: India is my country

Output: INDIA
IS
MY
COUNTRY

```
import java.util.*;
class Disintigrator13{
    public static void main(String args[]){
Scanner sc=new Scanner(System.in);
char temp;
System.out.println(" Enter a Sentence ");
String str=sc.nextLine();
String sent2=str.toUpperCase();
for(int i=0; i<str.length(); i++){
    temp=sent2.charAt(i);
    if(temp==' ')
        System.out.println();
        else
            System.out.print(temp);
        }
        sc.close();
    }
}
```

Program 16

Write a program to accept name and total marks of N number of students in two single subscript arrays name[ ] and total marks[ ].
Calculate and print:
The average of the total marks obtained by N number of students.
[average = (sum of total marks of all the students)/N]
Deviation of each student's total marks with the average.
[deviation = total marks of a student - average]

```
import java.util.Scanner;
public class student16 {
    public static void main(String[] args){
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the number of students");
        int n=sc.nextInt();
        String name[]=new String[n];
        float totalmarks[]=new float[n];
        System.out.println("Enter name & marks of "+n+" students");
        for(int i=0;i<n;i++){
            name[i]=sc.next();
            totalmarks[i]=sc.nextFloat();
        }
        float avg=0;
        for(int i=0;i<n;i++){
            avg+=totalmarks[i];
        }
        avg/=n;
        System.out.println("Average="+avg);
        for(int i=0;i<n;i++)
            System.out.println("Deviation of "+name[i]+"="+(totalmarks[i]-
avg));
        sc.close();
    }
}
```

Program 17

Design a class to overload a function check( ) as follows:

void check (String str , char ch) —
to find and print the frequency of a character in a string.
Example: Input: str = "success"
ch = 's'
Output: number of s present is = 3

void check(String s1) — to display only vowels from string s1, after converting it to lower case.
Example: Input: s1 ="computer"
Output = o u e

```
public class Overload17{
    static void check(String str,char ch){
        int n=0;
        for(int i=0;i<str.length();i++){
            if(str.charAt(i)==ch)n++;
        }
        System.out.println("Number of "+ch+" present :"+n);
    }
    static void check(String s1){
        for(int i=0;i<s1.length();i++){
            char a=s1.toLowerCase().charAt(i);
            if(a=='a'||a=='e'||a=='i'||a=='o'||a=='u')
                System.out.print(s1.charAt(i));
        }
    }
}
```

Program 18

Write a program to input forty words in an array. Arrange these words in descending order of alphabets, using selection sort technique. Print the sorted array.

```
import java.util.Scanner;
public class SelecSort18 {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        String arr[]=new String[40];
        System.out.println("Enter 40 words");
        for(int i=0;i<40;i++)
        arr[i]=sc.nextLine();
        int small=0,check;
        String temp;
        for(int i=0;i<39;i++){
            for(int j=i+1;j<40;j++){
                check=arr[small].compareToIgnoreCase(arr[j]);
                if(check<0)small=j;
            }
            temp=arr[i];
            arr[i]=arr[small];
            arr[small]=temp;
        }
        System.out.println("Sorted Array");
        for(int i=0;i<40;i++)
        System.out.print(arr[i]+"\t");
        sc.close();
    }
}
```

Program 19

Write a program to initialize the seven Wonders of the World along with their locations in two different arrays. Search for a name of the country input by the user. If found, display the name of the country along with its Wonder, otherwise display "Sorry not found!".

Seven Wonders:
CHICKEN ITZA, CHRIST THE REDEEMER, TAJ MAHAL, GREAT WALL OF CHINA, MACHU PICCHU, PETRA, COLOSSEUM

Locations:
MEXICO, BRAZIL, INDIA, CHINA, PERU, JORDAN, ITALY

Examples: Country name: INDIA
Output: TAJ MAHAL

Country name: USA
Output: Sorry Not found!

```
import java.util.Scanner;
public class Wonders19 {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        String wonder[]={"Chicken Itza","Christ the Redeemer”,          “Tajmahal”
,"Great Wall of China","Machu                          Picchu","Petra","Colosseum"};
        String location[]=
                                {"Mexico","Brazil","India","China","Peru","Jordan","Italy"};
        System.out.print("Country Name: ");
        String name=sc.nextLine();
        boolean flag=false;
        for(int i=0;i<7;i++){
            if(name.equalsIgnoreCase(location[i])){
                System.out.println(location[i]+"-"+wonder[i]);
                flag=true;
                break;
}
        }
        if(!flag)System.out.println("Sorry Not Found");
        sc.close();
    }
}
```

Program 20

Write a program to input and store roll numbers, names and marks in 3 subjects of n number of students in five single dimensional arrays and display the remark based on average marks as given below:

Average Marks	Remark
85 - 100	Excellent
75 - 84	Distinction
60 - 74	First Class
40 -59	Pass
Less than 40	Poor

```
import java.util.Scanner;
public class ReportCard20 {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the number of students");
        int n=sc.nextInt();
        int roll[]=new int[n];
        String name[]=new String[n];
        int m1[]=new int[n];
        int m2[]=new int[n];
        int m3[]=new int[n];
        System.out.println("Enter the roll no. name and marks
of                                  "+n+" student");
```

```
for(int i=0;i<n;i++){
    roll[i]=sc.nextInt();
    name[i]=sc.nextLine();
    m1[i]=sc.nextInt();
    m2[i]=sc.nextInt();
    m3[i]=sc.nextInt();
}
int avg;
String remark="";
for(int i=0;i<n;i++){
    System.out.print("Name:"+name[i]+"\troll.no.:"+roll[i]);
    avg=(m1[i]+m2[i]+m3[i])/3;
    if(avg<40){
        remark="Poor";
    }else if(avg<60){
        remark="Pass";
    }else if(avg<75){
        remark="First Class";
    }else if(avg<85){
        remark="Distinction";
    }else{
        remark="Excellent";
    }
    System.out.println("\t Remark:"+remark);
    }
    sc.close();
  }
}
```

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