SSN College of Engineering

Department of Computer Science and Engineering

UCS2313 – Object Oriented Programming Lab

II Year CSE - B Section (III Semester)

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Exercise 1.b. Java Programs- Classes, Objects and Constructors

Aim:

To implement basic java programs by giving input in the terminal.

1. **Develop a Java application to generate Electricity bill. Create a class with the following members: Consumer no., consumer name, previous month reading, current month reading, type of EB connection (i.e domestic or commercial). Compute the bill amount using the following tariff.**

   If the type of the EB connection is domestic, calculate the amount to be paid as follows:

   - **First 100 units - Rs. 1 per unit**
   - **101-200 units - Rs. 2.50 per unit**
   - **201 -500 units - Rs. 4 per unit**
   - **501 units - Rs. 6 per unit**

   If the type of the EB connection is commercial, calculate the amount to be paid as follows:

   - **First 100 units - Rs. 2 per unit**
   - **101-200 units - Rs. 4.50 per unit**
   - **201 -500 units - Rs. 6 per unit**
   - **501 units - Rs. 7 per unit**

Program code:

```
import java.util.Scanner;

class Electricity
{
    int consumer_no;
    String consumer_name,type;
    double prev_month_reading,cur_month_reading,bill_amount;

    Electricity(int consumer_no,String consumer_name,String type,double
prev_month_reading,double cur_month_reading)
    {
        this.consumer_no=consumer_no;
        this.consumer_name=consumer_name;
        this.type=type;
        this.prev_month_reading=prev_month_reading;
        this.cur_month_reading=cur_month_reading;
    }

    public void bill()
    {
        switch(type)
        {
            case "Domestic":
                if(cur_month_reading<=100)
                    bill_amount=cur_month_reading*1.0;
                else if(cur_month_reading<=200)
                    bill_amount=100*1.0+(cur_month_reading-100)*2.50;
                else if(cur_month_reading<=500)
                    bill_amount=100*1.0+100*2.50+(cur_month_reading-200)*4.0;
                else
                    bill_amount=100*1.0+100*2.50+300*4.0+(cur_month_reading-
500)*6;
                break;
            case "Commercial":
                if(cur_month_reading<=100)
                    bill_amount+=cur_month_reading*2.0;
                else if(cur_month_reading<=200)
                    bill_amount=100*2.0+(cur_month_reading-100)*4.50;
                else if(cur_month_reading<=500)
                    bill_amount=100*2.0+100*4.50+(cur_month_reading-200)*6.0;
                else
                    bill_amount=100*2.0+100*4.50+300*6.0+(cur_month_reading-
500)*7;
                break;
        }
        System.out.println(" Bill amount generated: "+bill_amount);
```

```
    }
}

class Main
{
    public static void main(String[] args)
    {
        Scanner scanner=new Scanner(System.in);
        System.out.println("Enter the consumer no.: ");
        int no=scanner.nextInt();
        scanner.nextLine();
        System.out.println("Enter the consumer name: ");
        String name=scanner.nextLine();
        System.out.println("Enter the type of EB connection
[Domestic/Commercial] : ");
        String type=scanner.nextLine();
        System.out.println("Enter the previous month reading: ");
        double prev=scanner.nextDouble();
        System.out.println("Enter the current month reading: ");
        double cur=scanner.nextDouble();
        Electricity object=new Electricity(no,name,type,prev,cur);
        object.bill();
    }
}
```

Output:

```
Enter the consumer no.:
2
Enter the consumer name:
Ram
Enter the type of EB connection [Domestic/Commercial] :
Domestic
Enter the previous month reading:
500
Enter the current month reading:
550
 Bill amount generated: 1850.0
```

2. **Write a java program to create a class named 'Student' with name, id, dept, 3 marks as data members. Write function to assign the inputs, calculate grade, display and search. Perform these operations for 'n' number of students. [Search using id and dept – use method overloading]**

Program code:

```
import java.util.Scanner;
class Student
{
    String name,grade,dept;
    int id,mark1,mark2,mark3,avg;

    public void assign_inputs(String name,String dept,int id,int mark1,int
mark2,int mark3)
    {
        this.name=name;
        this.dept=dept;
        this.id=id;
        this.mark1=mark1;
        this.mark2=mark2;
        this.mark3=mark3;
    }
    public void grade()
    {
        avg=(mark1+mark2+mark3)/3;
        if(avg>=90 && avg<=100) grade="O";
        else if(avg>=80 && avg<90) grade="A";
        else if(avg>=70 && avg<80) grade="B";
        else if(avg>=60 && avg<70) grade="C";
        else if(avg>=50 && avg<60) grade="D";
        else grade="E";
    }
    public void display()
    {
        System.out.println();
        System.out.println("Student details");
        System.out.println("Name: "+name);
        System.out.println("Department: "+dept);
        System.out.println("Id: "+id);
        System.out.println("Mark 1: "+mark1);
        System.out.println("Mark 2: "+mark2);
        System.out.println("Mark 3: "+mark3);
        System.out.println("Average: "+avg);
        System.out.println("Grade: "+grade);
        System.out.println();
```

```
    }
    public int search(int id1,String dept1)
    {
        if((id==id1)&&(dept.equals(dept1))) return 1;
        return 0;
    }
    public int search(int id1)
    {
        if(id==id1) return 1;
        return 0;
    }
}

class Main
{
    public static void main(String[] args)
    {
        Scanner scanner=new Scanner(System.in);
        int result;
        System.out.println("Enter the number of student details: ");
        int n=scanner.nextInt();
        Student []s=new Student[n];
        for(int i=0;i<n;i++)
        {
            s[i]=new Student();
            System.out.println("Enter the name: ");
            String name=scanner.nextLine();
            scanner.nextLine();
            System.out.println("Enter the department: ");
            String dept=scanner.nextLine();
            System.out.println("Enter the id: ");
            int id=scanner.nextInt();
            System.out.println("Enter the mark1: ");
            int mark1=scanner.nextInt();
            System.out.println("Enter the mark2: ");
            int mark2=scanner.nextInt();
            System.out.println("Enter the mark3: ");
            int mark3=scanner.nextInt();
            s[i].assign_inputs(name,dept,id,mark1,mark2,mark3);
            s[i].grade();
            s[i].display();
        }
        System.out.println("Searching Choices");
        System.out.println("1.Search using id and dept\n2.Search using id
alone");
        System.out.println("Enter the choice: ");
        int ch=scanner.nextInt();
        scanner.nextLine();
```

```
        switch (ch)
        {
            case 1:
                result=0;
                System.out.println("Enter the department :");
                String dept=scanner.nextLine();
                System.out.println("Enter the id :");
                int id1=scanner.nextInt();
                for(int i=0;i<n;i++)
                {
                    result=s[i].search(id1,dept);
                    if(result==1)
                        break;
                }
                if(result==1)   System.out.println("Student found...");
                else    System.out.println("Student not found...");
                break;
            case 2:
                result=0;
                System.out.println("Enter the id :");
                int id2=scanner.nextInt();
                for(int i=0;i<n;i++)
                {
                    result=s[i].search(id2);
                    if(result==1)
                        break;
                }
                if(result==1)   System.out.println("Student found...");
                else    System.out.println("Student not found...");
                break;
            default:
                System.out.println("Invalid choice...");
        }
    }
}
```

Output:

```
Enter the number of student details:
2
Enter the name:
Rohith
Enter the department:
CSE
Enter the id:
2110565
Enter the mark1:
100
Enter the mark2:
100
Enter the mark3:
99

Student details
Name:
Department: CSE
Id: 2110565
Mark 1: 100
Mark 2: 100
Mark 3: 99
Average: 99
Grade: O
```

```
Enter the name:
Krithick
Enter the department:
MECH
Enter the id:
2110566
Enter the mark1:
100
Enter the mark2:
99
Enter the mark3:
100

Student details
Name:
Department: MECH
Id: 2110566
Mark 1: 100
Mark 2: 99
Mark 3: 100
Average: 99
Grade: O

Searching Choices
1.Search using id and dept
2.Search using id alone
Enter the choice:
1
Enter the department :
CSE
Enter the id :
2110565
Student found...
```

3. **Write a java program to create a class named 'Employee' with name, id, designation, years-of-experience,basicpay, DA, HRA, LIC, PF and no. of hours worked. Write functions to calculate the gross pay and net pay.**

   - **If the designation is "Intern" then the salary can be calculated based on working hours.**
     Gross salary = no.of hours worked * hourly wage + DA as 2000 + HRA as 1000
     Deductions=LIC premium amount (if employee opted for that) + PF as 500
     Net salary= Gross salary – Deductions

   - **If the designation is "Manager" then**
     Gross salary = Basicpay + DA as 40% of basicpay + HRA as 10% of basicpay
     Deductions=LIC premium amount (if employee opted for that) + PF as 8% of basicpay
     Net salary= Gross salary – Deductions

   - **If the designation is "others – Trainee, Analyst, Software engineer, TeamLead" then**
     Gross salary = Basicpay + DA as 30% of basicpay + HRA as 10% of basicpay
     Deductions=LIC premium amount (if employee opted for that) + PF as 8% of basicpay
     Net salary= Gross salary – Deductions

   - **Calculate the Payroll for 'n' employees and display the salary details for all employees.**
   - **Prepare the payslip for a particular employee.**
   - **Promote a particular employee based on the years of experience.**

Program code:

```
import java.util.Scanner;
public class Employee
{
    String name,desgn;
    int id,years,hours;
    double bp,da,hra,lic,pf,grosspay,netpay,hourly_wage,deductions;

    public void assign(String name,int id,int years,int hours,double bp,String
desgn)
    {
        Scanner scanner=new Scanner(System.in);
        this.name=name;
        this.id=id;
        this.years=years;
```

```
        this.hours=hours;
        this.bp=bp;
        this.desgn=desgn;

        switch(desgn)
        {
            case "Intern":
                System.out.println("Enter the hourly wage: ");
                this.hourly_wage=scanner.nextDouble();
                System.out.println("Enter the LIC amount: ");
                this.lic=scanner.nextDouble();
                this.da=2000.0;this.hra=1000;this.pf=500;
                this.grosspay=hours*hourly_wage+da+hra;
                this.deductions=lic+pf;
                this.netpay=grosspay-deductions;
                break;
            case "Manager":
                System.out.println("Enter the LIC amount: ");
                this.lic=scanner.nextDouble();
                this.hra=0.1*bp;this.pf=0.08*bp;
                this.da=0.4*bp;
                this.grosspay=bp+da+hra;
                this.deductions=lic+pf;
                this.netpay=grosspay-deductions;
                break;
            case "Others":
                System.out.println("Enter the LIC amount: ");
                lic=scanner.nextDouble();
                double hourly_wage2=1.0;
                hra=0.1*bp;pf=0.08*bp;
                da=0.3*bp;
                grosspay=bp+da+hra;
                deductions=lic+pf;
                netpay=grosspay-deductions;
                break;
            default:
                System.out.println("Error designation...");
        }
    }

    public void display()
    {
        System.out.println("\nName = "+name);
        System.out.println("ID = "+id);
        System.out.println("Gross Salary = "+grosspay);
        System.out.println("Deductions = "+deductions);
        System.out.println("Net Salary = "+netpay+"\n");
    }
```

```
}

class Main
{
    public static void main(String []args)
    {
        Scanner scanner=new Scanner(System.in);
        System.out.println("Enter the total no. of Employees: ");
        int n=scanner.nextInt();
        scanner.nextLine();
        Employee []employee=new Employee[n];
        for(int i=0;i<n;i++)
        {
            System.out.println("Enter the name: ");
            String name=scanner.nextLine();
            System.out.println("Enter the id: ");
            int id=scanner.nextInt();
            System.out.println("Enter the years of experience: ");
            int years=scanner.nextInt();
            System.out.println("Enter the no. of hours worked: ");
            int hours=scanner.nextInt();
            System.out.println("Enter the basic pay: ");
            double bp=scanner.nextDouble();
            scanner.nextLine();
            System.out.println("Enter the designation [Intern, Manager,
Others] : ");
            String desgn=scanner.nextLine();
            employee[i]=new Employee();
            employee[i].assign(name,id,years,hours,bp,desgn);

        }
        System.out.println("Salary details for all emplyees...");
        for(int i=0;i<n;i++)
            employee[i].display();
    }
}
```

Output:

```
Enter the total no. of Employees:
2
Enter the name:
John Cena
Enter the id:
1
Enter the years of experience:
4
Enter the no. of hours worked:
7
Enter the basic pay:
100000
Enter the designation [Intern, Manager, Others] :
Manager
Enter the LIC amount:
10000
Enter the name:
Dwayne Johnson
Enter the id:
2
Enter the years of experience:
6
Enter the no. of hours worked:
8
Enter the basic pay:
150000
Enter the designation [Intern, Manager, Others] :
Others
Enter the LIC amount:
15000
Salary details for all emplyees...
```

```
Name = John Cena
ID = 1
Gross Salary = 150000.0
Deductions = 18000.0
Net Salary = 132000.0


Name = Dwayne Johnson
ID = 2
Gross Salary = 210000.0
Deductions = 27000.0
Net Salary = 183000.0
```

Learning Outcome:

Thus basic programs using java programming language has been written and executed successfully using command line arguments as well as input from the user in the terminal.