

Assignment-7

/*

1) Create a class Employee with three data members (empNo, salary and totalSalary) and following features.

Only parameterized constructor. [Do not overload the constructor]

totalSalary always represents salary total of all the employees created.

empNo should be auto incremented.

display total employees and totalSalary using a method.

Create another class EmployeeDemo (main class) that creates some Employee objects and calls Employee method to display

no. of employees and total of their salaries.

*/

```
package Assignment3;
```

```
class Employee
```

```
{
```

```
    static int empNo=0;
```

```
    int salary;
```

```
    static int totalSalary=0;
```

```
    Employee(int salary)
```

```
    {
```

```
        this.salary=salary;
```

```
        empNo++;
```

```
        totalSalary+=salary;
```

```
    }
```

```
    static void display()
```

```
    {
```

```
        System.out.println("Total Employees :"+empNo);
```

```
        System.out.println("Total Salary :"+totalSalary);
```

```

    }

}

public class EmployeeDemo {
    public static void main(String args[])
    {
        Employee emp1=new Employee(1000);
        Employee emp2=new Employee(2000);
        Employee emp3=new Employee(5000);
        Employee emp4=new Employee(2000);
        Employee emp5=new Employee(10000);
        Employee.display();
    }
}

```

```

/*

```

2) Create a class MathOperation that has four static methods. add() method that takes two integer numbers as parameter and returns

the sum of the numbers. subtract() method that takes two integer numbers as parameter and returns the difference of the numbers.

multiply() method that takes two integer numbers as parameter and returns the product. power() method that takes two integer

numbers as parameter and returns the power of first number to second number. Create another class Demo (main class) that takes

the two numbers from the user and calls all four methods of MathOperation class by providing entered numbers and prints the

return values of every method.

```

*/

```

```

package Assignment3;

```

```

import java.util.Scanner;

```

```

class MathOperation1

```

```
{  
    static int add(int a,int b)  
    {  
        int c=0;  
        c=a+b;  
        return c;  
    }  
    static int subtract(int a,int b)  
    {  
        int c=0;  
        c=a-b;  
        return c;  
    }  
    static int multiply(int a,int b)  
    {  
        int c=0;  
        c=a*b;  
        return c;  
    }  
    static int power(int a,int b)  
    {  
        int c=0;  
        c=(int) Math.pow(a,b);  
        return c;  
    }  
}  
  
public class Demo {  
    public static void main(String args[])  
    {  
        Scanner sc=new Scanner(System.in);
```

```

        System.out.println("Enter first number");
        int fno=sc.nextInt();
        System.out.println("Enter second number");
        int sno=sc.nextInt();
        int add=MathOperation1.add(fno, sno);
        System.out.println("Addition : "+add);
        int sub=MathOperation1.subtract(fno, sno);
        System.out.println("Substraction : "+sub);
        int mul=MathOperation1.multiply(fno, sno);
        System.out.println("Multiplication : "+mul);
        int pow=MathOperation1.power(fno, sno);
        System.out.println("Power : "+pow);

    }
}

```

/*

3) Create a class Circle that has two data members,one to store the radius and another to store area and three methods first init() method

to input radius from user, second calculateArea() method to calculate area of circle and third display() method to display values of radius and area.

Create class CircleDemo (main class) that creates the Circle object and calls init(), calculateArea() and display() methods.

*/

```

package Assignment3;

import java.util.Scanner;

```

```

class Circle
{
    int radius;
    double area;

```

```

void init()
{
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter the radius :");
    radius=sc.nextInt();
}
void calculateArea()
{
    area=3.14*radius*radius;
}
void display()
{
    System.out.println("Radius :"+radius);
    System.out.println("Area :"+area);
}
}

```

```

public class CircleDemo {
    public static void main(String args[])
    {
        Circle cl=new Circle();
        cl.init();
        cl.calculateArea();
        cl.display();
    }
}

```

/*

4) Create an Abstract class Processor with int member variable data and method showData to display data value.

Create abstract method process() to define processing of member data. Create a class Factorial using abstract class Processor

to calculate and print factorial of a number by overriding the process method.

b. Create a class Circle using abstract class Processor to calculate and print area of a circle by overriding the process method.

Ask user to enter choice (factorial or circle area). Also ask data to work upon. Use Processor class reference to achieve this

mechanism.

```
*/
```

```
package Assignment3;
```

```
import java.util.Scanner;
```

```
abstract class Processor
```

```
{
```

```
    static int num;
```

```
    abstract void process();
```

```
    abstract void showData();
```

```
}
```

```
class Factorial extends Processor
```

```
{
```

```
    int fact=1;
```

```
    @Override
```

```
    void process()
```

```
    {
```

```
        while(num>0)
```

```
        {
```

```
            fact=fact*num;
```

```
            num--;
```

```
        }
```

```
    }
```

```
    @Override
```

```
    void showData()
```

```

    {
        System.out.println("Factorial of a number is "+fact);
    }
}

class Circle1 extends Processor
{
    double area=0;
    void process()
    {
        area=3.14*num*num;
    }

    void showData()
    {
        System.out.println("Area of a circle is "+area);
    }
}

public class FactorialDemo {
    public static void main(String args[])
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the number :");
        Processor.num=sc.nextInt();
        System.out.println("1. Factorial\n2. Area of circle");
        System.out.println("Enter your choice :");
        int ch=sc.nextInt();
        if(ch==1)
        {
            Factorial f1=new Factorial();
            f1.process();
            f1.showData();
        }
    }
}

```

```

    }
    else
    {
        Circle1 c1=new Circle1();
        c1.process();
        c1.showData();
    }
}
}

```

/* 5) Create three classes

*Faculty with two data members facultyId and salary and two methods, one input() method for accepting facultyId as input and

another printSalary() to print salary.

*FullTimeFaculty that inherits class Faculty with two data members' basicSalary and allowance. Override input() method in this

class that calls super class input() method and accepts basicSalary and allowance as input. Salary should not be accepted as input

but should be calculated using formula (basicSalary + allowance)

*PartTimeFaculty that inherits class Faculty with two data members' workingHours, ratePerHour. Override input() method in this

class that calls super class input() method and accepts workingHours and ratePerHour as input. Salary should not be accepted as

input but should be calculated using formula (workingHour * ratePerHour)

*/

```
package Assignment3;
```

```
import java.util.Scanner;
```

```
class Faculty
```

```
{
```

```
    int facultyId;
```

```
    int salary;
```

```
    Scanner sc=new Scanner(System.in);
```



```

void input()
{
    System.out.println("Enter faculty id :");
    facultyId=sc.nextInt();
}
void printSalary()
{
    System.out.println("Salary :"+salary);
}
}
class FullTimeFaculty extends Faculty
{
    int basicSalary;
    int allowance;
    void input()
    {
        super.input();
        System.out.println("Enter basic salary :");
        basicSalary=sc.nextInt();
        System.out.println("Enter allowance :");
        allowance=sc.nextInt();
        salary=basicSalary+allowance;
        printSalary();
    }

}
class PartTimeFaculty extends Faculty
{
    int workingHour;
    int ratePerHour;
    void input()

```

```

{
    super.input();

    System.out.println("Enter working hour :");
    workingHour=sc.nextInt();

    System.out.println("Enter rate per hour :");
    ratePerHour=sc.nextInt();

    salary=workingHour*ratePerHour;

    printSalary();
}

}

public class FacultyDemo {
    public static void main(String args[])
    {
        FullTimeFaculty ft=new FullTimeFaculty();

        ft.input();

        PartTimeFaculty pt=new PartTimeFaculty();

        pt.input();
    }
}

```

/*

6) Create a class OneBHK with instance variables roomArea, hallArea and price. Then create default constructor that initializes

instance variables with some values and a parameterized constructor that takes values for all instance variables and stores them

in instance variables. Now create a method named show() to print OneBHK's instance variable values.

Create another class TwoBHK which has (inherits) all the properties and behaviors of OneBHK and a new instance variable room2Area.

Then create default constructor to initialize all 4 instance variables and a parameterized constructor to take the values for

initialization of all instance variables. Override show() method to print all data member information.

Write main method in another class (Say Demo) and store three TwoBHK flat's information and print information using show method.

Also print total amount of all flats.* /

```
package Assignment3;
```

```
import java.util.Scanner;
```

```
class OneBHK
```

```
{
```

```
    double roomArea;
```

```
    double hallArea;
```

```
    double price=0;
```

```
    OneBHK()
```

```
{
```

```
    roomArea=0.0;
```

```
    hallArea=0.0;
```

```
    price=0.0;
```

```
}
```

```
    OneBHK(double roomArea,double hallArea,double price)
```

```
{
```

```
    this();
```

```
    this.roomArea=roomArea;
```

```
    this.hallArea=hallArea;
```

```
    this.price=price;
```

```
}
```

```
    void show()
```

```
{
```

```
        System.out.println("Area of room1 :"+roomArea);
```

```
        System.out.println("Area of hall :"+hallArea);
```

```
        System.out.println("Price :"+price);
```

```

    }
}
class TwoBHK extends OneBHK
{
    double room2Area;
    TwoBHK()
    {
        super();
        room2Area=0.0;
    }
    TwoBHK(double room2Area,double roomArea,double hallArea,double price)
    {
        super(roomArea,hallArea,price);
        this.room2Area=room2Area;
    }
    void show()
    {
        System.out.println("Area of room2 :"+room2Area);
        super.show();
        System.out.println("-----");
    }
}

public class FlatDemo {
    public static void main(String args[])
    {
        Scanner sc=new Scanner(System.in);
        TwoBHK b[]=new TwoBHK[3];
        for(int i=0;i<3;i++)
        {
            System.out.println("Enter details :");

```

```

        System.out.println("Enter area of room2 :");
        double room2Area=sc.nextDouble();
        System.out.println("Enter area of room1 :");
        double roomArea=sc.nextDouble();
        System.out.println("Enter area of hall :");
        double hallArea=sc.nextDouble();
        System.out.println("Enter price of flat");
        double price=sc.nextDouble();
        b[i]=new TwoBHK(room2Area,roomArea,hallArea,price);
    }
    for(int i=0;i<3;i++)
    {
        b[i].show();
    }
    double totalAmt=0;
    for(int i=0;i<3;i++)
    {
        totalAmt=totalAmt+b[i].price;
    }
    System.out.println("Total amount of all flats is "+totalAmt);
}
}

```

/*

7) Que->Create a class MathOperation containing overloaded methods 'multiply' to calculate multiplication of following arguments.

*two integers

*three floats

*all elements of array

*one double and one integer

```
*/
```

```
package Assignment3;
```

```
public class MathOperation {
```

```
    int multiply(int a,int b)
```

```
    {
```

```
        int c=0;
```

```
        c=a*b;
```

```
        return c;
```

```
    }
```

```
    double multiply(float a,float b,float c)
```

```
    {
```

```
        double d=0.0;
```

```
        d=a*b*c;
```

```
        return d;
```

```
    }
```

```
    long multiply(int arr[])
```

```
    {
```

```
        long l=1;
```

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

```
        {
```

```
            l=l*arr[i];
```

```
        }
```

```
        return l;
```

```
    }
```

```
    double multiply(double a,int b)
```

```
    {
```

```
        double d=0.0;
```

```
        d=a*b;
```

```
        return d;
```

```
    }
```

```
public static void main(String args[])
{
    MathOperation mop=new MathOperation();
    int i=mop.multiply(5, 2);
    System.out.println("Two integers multiplication :"+i);
    double d=mop.multiply(2.5f, 3.5f, 2.0f);
    System.out.println("Three float numbers multiplication :"+d);
    int arr[]={1,2,3,4,5};
    long a=mop.multiply(arr);
    System.out.println("Array multiplication :"+a);
    double x=mop.multiply(5.5,3);
    System.out.println("One double and one integer multiplication :"+x);

}
}
```