Name:Sumit kalshetty

Class: SE-IT-A

Roll no. 2125

Subject: OOP LAB

Practical 10: Factory Design Pattern

Problem Statement:
Implement Factory design pattern for the given context. Consider Car building process, which requires many steps from allocating accessories to final makeup. These steps should be written as methods and should be called while creating an instance of a specific car type. Hatchback, Sedan, SUV could be the subclasses of Car class. Car class and its subclasses, CarFactory and TestFactoryPattern should be implemented.

**********PROGRAM**********

```
* package assignment;

import java.util.Scanner;

abstract class Car_Factory{
        String compnay,car_name;
        double budget;


        //declaration of abstract methods
        abstract void getprice(double price);
        abstract void detail(String company_name,String
        car_name); abstract void accessories();
```

```
        //declaration and implentation of input method
        void input() {
        Scanner scan =new Scanner (System.in);//creating object of scanner
                class System.out.print("Company- ");
                 compnay=scan.next();//taking input from user
                System.out.print("Car- ");
                 car_name=scan.next();//taking input from user
                System.out.print("Rough Budget(in Lakhs)- ");
                 budget=scan.nextDouble();//taking input from user
        }
        void display(Car_Factory obj1) {
                //calling the methods//
                obj1.getprice(budget);//calling getprice method
                System.out.println("\n-----------------------------------");
                obj1.detail(compnay, car_name);//calling detail method
                System.out.println("\n-----------------------------------");
                obj1.accessories();//calling accessories method
                System.out.println("\n-----------------------------------");
        }

}
   class Small_car extends Car_Factory{
        String Ans;//declaration of data member
```

```
//method for getprice
public void getprice(double price) {
        if(price>2&&price<5)
                Ans="No"; //modify Ans
        else
                Ans="Yes"; //modify Ans

}
//method for displaying car detail//
 public void detail(String company_name,String car_name)
    { System.out.println("Company- "+company_name);
        System.out.println("Name of Car- "+car_name);
        System.out.println("Color-
        Black/White/Orange/Red"); System.out.println("Fuel-
        Petrol");
        System.out.println("Gears- Manual");
}

//method to display accessories of car//
public void accessories() {
        System.out.println("Types of Tyres- Alloy Wheels");
        System.out.println("Airbags- "+Ans);
        System.out.println("Back Wiper- "+Ans);
```

```
            System.out.println("Side Mirror- Two");
            System.out.println("Touch Screen Music Player-
        "+Ans); }
}

//============================== CLASS Sedan
==============================//
class Sedan extends Car_Factory{
        String Ans;//declaration of data member

        //method for getprice
        public void getprice(double price) {
            if(price>6&&price<10)
                Ans="No"; //modify Ans
            else
                Ans="Yes"; //modify Ans
        }

        //method for displaying car detail//
         public void detail(String company_name,String car_name)
            { System.out.println("Company- "+company_name);
            System.out.println("Name of Car- "+car_name);
            System.out.println("Color-
            Black/White/Orange/Red"); System.out.println("Fuel-
```

```
            Petrol/Diesel");
            System.out.println("Gears- Auto/Manual");
        }
        //method to display accessories of car//
        public void accessories() {
            System.out.println("Types of Tyres- Alloy Wheels");
            System.out.println("Airbags- YES");
            System.out.println("Back Wiper- YES");
            System.out.println("Side Mirror- Two");
            System.out.println("Touch Screen Music Player-
            YES"); System.out.println("Roof Window- "+Ans);
        }
}

//============================== CLASS Small_car
==============================//
class Luxary extends Car_Factory{
        String Ans;//declaration of data member

        //method for getprice
        public void getprice(double price) {
            if(price>10&&price<14)
                Ans="No"; //modify Ans
            else
                Ans="Yes"; //modify Ans
```

```
}

//method for displaying car detail//
 public void detail(String company_name,String car_name)
     { System.out.println("Company- "+company_name);
         System.out.println("Name of Car- "+car_name);
         System.out.println("Color-
         Black/White/Orange/Red"); System.out.println("Fuel-
         Diesel");
         System.out.println("Gears- Auto");
}

//method to display accessories of car//
public void accessories() {
         System.out.println("Types of Tyres- Alloy Wheels");
         System.out.println("Airbags- YES");
         System.out.println("Back Wiper- YES");
         System.out.println("Side Mirror- Two");
         System.out.println("Touch Screen Music Player-
         YES"); System.out.println("Roof Window- YES");
         System.out.println("Automotive Garbage Cans-
         "+Ans); System.out.println("Automotice Air Freshner-
         "+Ans); System.out.println("Button Start- "+Ans);
```

```
	}
}
//============================== MAIN CLASS ==============================//
public class FactoryDemo {


	//ststic main method
	public static void main(String[] args) {
		// TODO Auto-generated method stub
		Scanner scan = new Scanner(System.in);//creating object of scanner class
		int ch;
		//double price;
		Car_Factory obj;// object of reference Car_Factory
		while(true){
			//menu driven
			System.out.println("Which Car you want to See?- ");
			System.out.println("\n\t1.Small Car\n\t2.Sedan Car\n\t3.Luxary Car\n\t4.Exit");
			ch=scan.nextInt();//taking input from user
			System.out.println();
			//switch case
			switch(ch) {

				case 1:
					obj= new Small_car(); //creating object of
```

Small_car

```
                obj.input();//calling input method
                obj.display(obj);//calling display method
                break;

            case 2:
                obj= new Sedan();//creating object of Sedan
                obj.input();//calling input method
                obj.display(obj);//calling display method
                break;

            case 3:
                obj= new Luxary();//creating object of Luxary
                obj.input();//calling input method
                obj.display(obj);//calling display method
                break;

            case 4:
            System.out.println("\n---------------------------------");
                return;//stop execution of program

            default:
             System.out.println("INVALID CHOICE !!");//default
            System.out.println("\n---------------------------------");
                break;
```

}}}
**********OUTPUT**********

Constructing Hatchback Car

Types of Tyres- Alloy Wheels

Airbags- YES

Back Wiper- YES

Side Mirror- one

Touch Screen Music Player- NO

Roof Window- YES

Automotive Garbage Cans- YES

Automotice Air Freshner- NO

Button Start- YES

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assignment.hatchback1@17a7cec2

Constructing sedan car

Types of Tyres- Alloy Wheels

Airbags- YES

Back Wiper- NO

Side Mirror- ONE
Touch Screen Music Player- YES

Roof Window- YES

Automotive Garbage Cans-

YES Automotice Air Freshner-

NO Button Start- YES

-

assignment.sedan2@6f539caf

- Constructing SUV Car

- Types of Tyres- Alloy Wheels

Airbags- YES

Back Wiper- YES

Side Mirror- Two

Touch Screen Music Player- YES

Roof Window- YES

Automotive Garbage Cans-

NO Automotice Air Freshner-

YES Button Start- YES

- assignment.suv@50040f0c