Lab Assignment 10

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Factory Design Pattern

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.

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import java.util.Scanner;

enum model{

SEDAN,

SUV,

HATCHBACK

}

public class Main {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

Car car;

int count = 0;

while(true){

System.out.println("Welcome.");

if(count == 0){

System.out.print("Enter Car You Want to Construct : ");

count++;

}

else{

System.out.print("Enter Car You Want to Construct (Enter 'exit' to exit from program) : ");

}

String carName = sc.next().toUpperCase();

System.out.println();

if(carName.equals("EXIT")){

System.out.println("Exiting the Program...");

break;

}

car = CarFactory.constructCar(model.valueOf(carName));

car.construct();

}

}

}

public class CarFactory {

public static Car constructCar(model name){

Car car = null;

switch (name) {

case SEDAN:

car = new Sedan();

break;

case SUV:

car = new SUV();

break;

case HATCHBACK:

car = new HatchBack();

break;

default:

break;

}

return car;

}

}

public class HatchBack implements Car {

private String carName = "HatchBack";

private String carMaterial = "";

private String engine = "";

public String getCarName(){

return carName;

}

Scanner sc= new Scanner(System.in);

@Override

public void construct() {

System.out.println("Constructing HatchBack...");

System.out.println();

constructEngine();

carFrame();

displayInfo();

}

private void constructEngine(){

System.out.println("Which Engine You Want to use.");

System.out.println("1. Ferrari 3.9-litre twin-turbo V8");

System.out.println("2. BMW M 3.2-litre straight-six");

System.out.println("3. Ford 1.0-litre EcoBoost");

System.out.println();

System.out.print("Enter Your Choice : ");

int choice = sc.nextInt();

switch (choice){

case 1:

engine = "Ferrari 3.9-litre twin-turbo V8";

break;

case 2:

engine = "BMW M 3.2-litre straight-six";

break;

case 3:

engine = "Ford 1.0-litre EcoBoost";

break;

default:

System.out.println("Enter Valid Choice..");

break;

}

System.out.println(engine + " engine added to HatchBack.");

System.out.println();

}

private void carFrame(){

System.out.println("Which material you want use for Frame.");

System.out.println("1. Steel");

System.out.println("2. Carbon Fibre");

System.out.println();

System.out.print("Enter Your Choice : ");

int choice = sc.nextInt();

switch (choice){

case 1:

carMaterial = "Steel";

break;

case 2:

carMaterial = "Carbon Fibre";

break;

default:

System.out.println("Enter Valid Choice..");

break;

}

System.out.println(carMaterial + " is Used to Build Car Frame.");

System.out.println();

}

private void displayInfo(){

System.out.println("----Car Details----");

System.out.println("Car Name : " + getCarName());

System.out.println("Car Engine : " + engine);

System.out.println("Car Frame Material : " + carMaterial);

System.out.println();

}

}

public class Sedan implements Car{

private String carName = "Sedan";

private String carMaterial = "";

private String engine = "";

public String getCarName(){

return carName;

}

Scanner sc= new Scanner(System.in);

@Override

public void construct() {

System.out.println("Constructing Sedan...");

System.out.println();

constructEngine();

carFrame();

displayInfo();

}

private void constructEngine(){

System.out.println("Which Engine You Want to use.");

System.out.println("1. Ferrari 3.9-litre twin-turbo V8");

System.out.println("2. BMW M 3.2-litre straight-six");

System.out.println("3. Ford 1.0-litre EcoBoost");

System.out.println();

System.out.print("Enter Your Choice : ");

int choice = sc.nextInt();

switch (choice){

case 1:

engine = "Ferrari 3.9-litre twin-turbo V8";

break;

case 2:

engine = "BMW M 3.2-litre straight-six";

break;

case 3:

engine = "Ford 1.0-litre EcoBoost";

break;

default:

System.out.println("Enter Valid Choice..");

break;

}

System.out.println(engine + " engine added to SUV.");

System.out.println();

}

private void carFrame(){

System.out.println("Which material you want use for Frame.");

System.out.println("1. Steel");

System.out.println("2. Carbon Fibre");

System.out.println();

System.out.print("Enter Your Choice : ");

int choice = sc.nextInt();

switch (choice){

case 1:

carMaterial = "Steel";

break;

case 2:

carMaterial = "Carbon Fibre";

break;

default:

System.out.println("Enter Valid Choice..");

break;

}

System.out.println("Car Material : " + carMaterial);

System.out.println();

}

private void displayInfo(){

System.out.println("----Car Details----");

System.out.println("Car Name : " + getCarName());

System.out.println("Car Engine : " + engine);

System.out.println("Car Frame Material : " + carMaterial);

System.out.println();

}

}

import java.util.Scanner;

public class SUV implements Car{

private String carName = "SUV";

private String carMaterial = "";

private String engine = "";

public String getCarName(){

return carName;

}

Scanner sc= new Scanner(System.in);

@Override

public void construct() {

System.out.println("Constructing SUV...");

System.out.println();

constructEngine();

carFrame();

displayInfo();

}

private void constructEngine(){

System.out.println("Which Engine You Want to use.");

System.out.println("1. Ferrari 3.9-litre twin-turbo V8");

System.out.println("2. BMW M 3.2-litre straight-six");

System.out.println("3. Ford 1.0-litre EcoBoost");

System.out.println();

System.out.print("Enter Your Choice : ");

int choice = sc.nextInt();

switch (choice){

case 1:

engine = "Ferrari 3.9-litre twin-turbo V8";

break;

case 2:

engine = "BMW M 3.2-litre straight-six";

break;

case 3:

engine = "Ford 1.0-litre EcoBoost";

break;

default:

System.out.println("Enter Valid Choice..");

break;

}

System.out.println(engine + " engine added to SUV.");

System.out.println();

}

private void carFrame(){

System.out.println("Which material you want use for Frame.");

System.out.println("1. Steel");

System.out.println("2. Carbon Fibre");

System.out.println();

System.out.print("Enter Your Choice : ");

int choice = sc.nextInt();

switch (choice){

case 1:

carMaterial = "Steel";

break;

case 2:

carMaterial = "Carbon Fibre";

break;

default:

System.out.println("Enter Valid Choice..");

break;

}

System.out.println("Car Material : " + carMaterial);

System.out.println();

}

private void displayInfo(){

System.out.println("----Car Details----");

System.out.println("Car Name : " + getCarName());

System.out.println("Car Engine : " + engine);

System.out.println("Car Frame Material : " + carMaterial);

System.out.println();

}

}

**Output :**

Welcome.

Enter Car You Want to Construct : Sedan

Constructing Sedan...

Which Engine You Want to use.

1. Ferrari 3.9-litre twin-turbo V8

2. BMW M 3.2-litre straight-six

3. Ford 1.0-litre EcoBoost

Enter Your Choice : 1

Ferrari 3.9-litre twin-turbo V8 engine added to SUV.

Which material you want use for Frame.

1. Steel

2. Carbon Fibre

Enter Your Choice : 2

Car Material : Carbon Fibre

----Car Details----

Car Name : Sedan

Car Engine : Ferrari 3.9-litre twin-turbo V8

Car Frame Material : Carbon Fibre

Welcome.

Enter Car You Want to Construct (Enter 'exit' to exit from program) : SUV

Constructing SUV...

Which Engine You Want to use.

1. Ferrari 3.9-litre twin-turbo V8

2. BMW M 3.2-litre straight-six

3. Ford 1.0-litre EcoBoost

Enter Your Choice : 3

Ford 1.0-litre EcoBoost engine added to SUV.

Which material you want use for Frame.

1. Steel

2. Carbon Fibre

Enter Your Choice : 1

Car Material : Steel

----Car Details----

Car Name : SUV

Car Engine : Ford 1.0-litre EcoBoost

Car Frame Material : Steel

Welcome.

Enter Car You Want to Construct (Enter 'exit' to exit from program) : exit

Exiting the Program...