

The Government of the Russian Federation

**The Federal State Autonomous Institution of Higher Education
"National Research University - Higher School of Economics"**

National Research University «Higher School of Economics»

Faculty of Information Technology and Computer Engineering
Department of Computer Systems and Networks

Course title: Network computing

Practical training № 2, 3. Classes.

Senior lecturer

Baybikova T.N.

Student:

Anna Kalinina

Date: 05.06.2019

Grade:

Moscow 2019

Practical training № 2, 3. Classes.

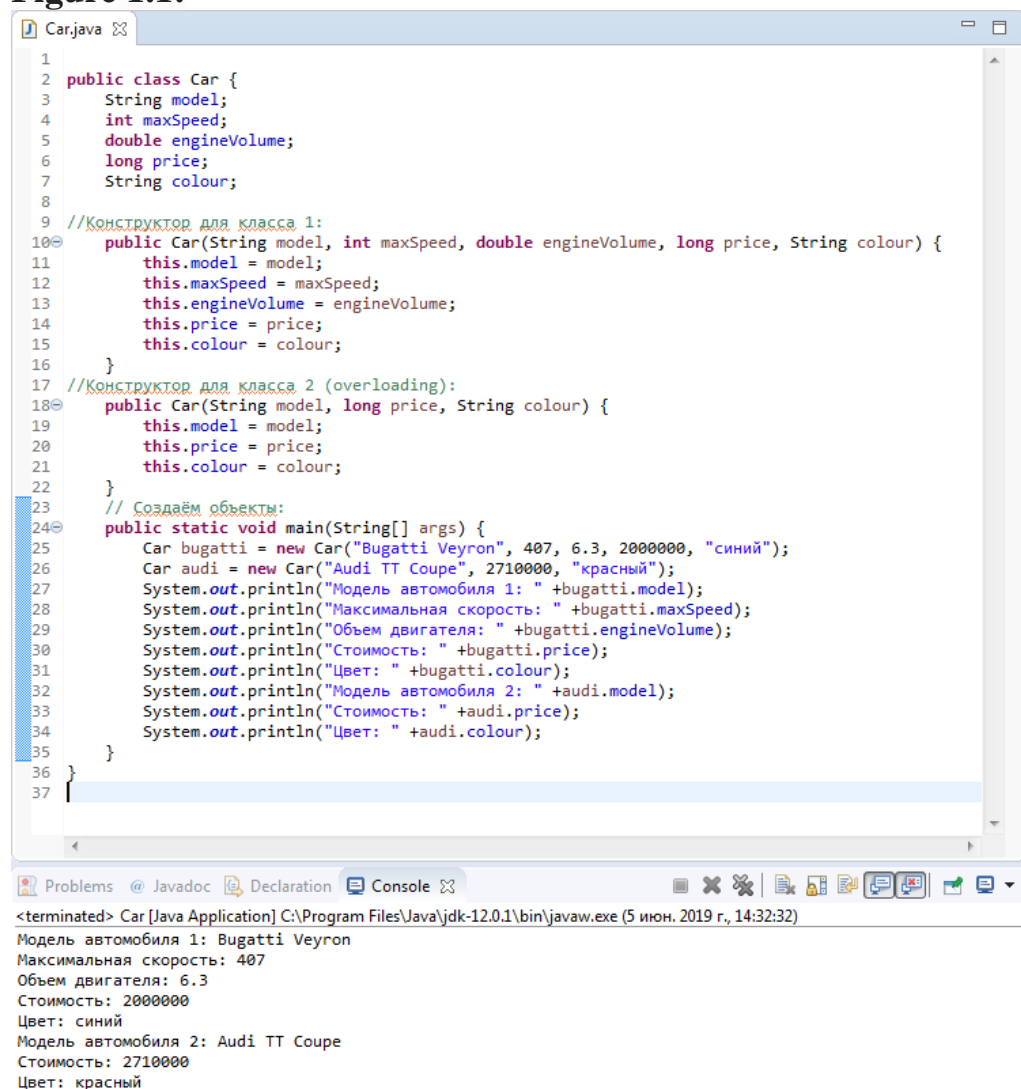
Table of contents

- 1.) Goal (цель): practice designing a class.
- 2.) Variant: (вариант): 13. Car
- 3.) Class diagram.

CarVip
Model
maxSpeed
engineVolume
Price
Colour

- 4.) Listings of the designed class (or classes).

Figure 1.1:



```
1 public class Car {
2     String model;
3     int maxSpeed;
4     double engineVolume;
5     long price;
6     String colour;
7
8
9     //Конструктор для класса 1:
10    public Car(String model, int maxSpeed, double engineVolume, long price, String colour) {
11        this.model = model;
12        this.maxSpeed = maxSpeed;
13        this.engineVolume = engineVolume;
14        this.price = price;
15        this.colour = colour;
16    }
17    //Конструктор для класса 2 (overloading):
18    public Car(String model, long price, String colour) {
19        this.model = model;
20        this.price = price;
21        this.colour = colour;
22    }
23    // Создаём объекты:
24    public static void main(String[] args) {
25        Car bugatti = new Car("Bugatti Veyron", 407, 6.3, 2000000, "синий");
26        Car audi = new Car("Audi TT Coupe", 2710000, "красный");
27        System.out.println("Модель автомобиля 1: " + bugatti.model);
28        System.out.println("Максимальная скорость: " + bugatti.maxSpeed);
29        System.out.println("Объем двигателя: " + bugatti.engineVolume);
30        System.out.println("Стоимость: " + bugatti.price);
31        System.out.println("Цвет: " + bugatti.colour);
32        System.out.println("Модель автомобиля 2: " + audi.model);
33        System.out.println("Стоимость: " + audi.price);
34        System.out.println("Цвет: " + audi.colour);
35    }
36 }
37 }
```

Problems @ Javadoc Declaration Console

<terminated> Car [Java Application] C:\Program Files\Java\jdk-12.0.1\bin\javaw.exe (5 июн. 2019 г., 14:32:32)

Модель автомобиля 1: Bugatti Veyron
Максимальная скорость: 407
Объем двигателя: 6.3
Стоимость: 2000000
Цвет: синий
Модель автомобиля 2: Audi TT Coupe
Стоимость: 2710000
Цвет: красный

Listing 1.2. (class, objects, constructors, overloading):

```
public class Car {
    String model;
    int maxSpeed;
    double engineVolume;
    long price;
    String colour;

    //Конструктор для класса 1:
    public Car(String model, int maxSpeed, double engineVolume, long price, String
colour) {
        this.model = model;
        this.maxSpeed = maxSpeed;
        this.engineVolume = engineVolume;
        this.price = price;
        this.colour = colour;
    }

    //Конструктор для класса 2 (overloading):
    public Car(String model, long price, String colour) {
        this.model = model;
        this.price = price;
        this.colour = colour;
    }

    // Создаём объекты:
    public static void main(String[] args) {
        Car bugatti = new Car("Bugatti Veyron", 407, 6.3, 2000000, "синий");
        Car audi = new Car("Audi TT Coupe", 2710000, "красный");
        System.out.println("Модель автомобиля 1: " + bugatti.model);
        System.out.println("Максимальная скорость: " + bugatti.maxSpeed);
        System.out.println("Объем двигателя: " + bugatti.engineVolume);
        System.out.println("Стоимость: " + bugatti.price);
        System.out.println("Цвет: " + bugatti.colour);
        System.out.println("Модель автомобиля 2: " + audi.model);
        System.out.println("Стоимость: " + audi.price);
        System.out.println("Цвет: " + audi.colour);
    }
}
```

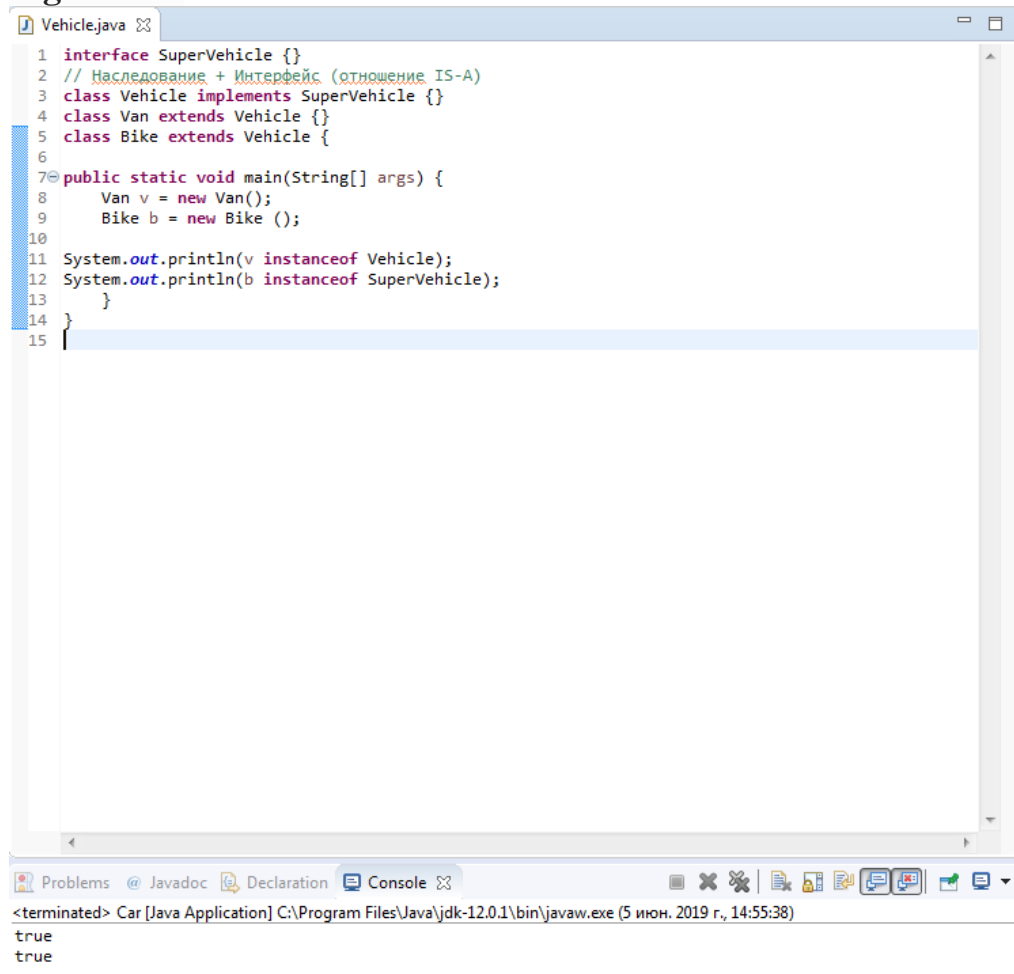
Listing 2.1. (IS-A Relationship):

```
interface SuperVehicle {}
// Наследование + Интерфейс (отношение IS-A)
class Vehicle implements SuperVehicle {}
class Van extends Vehicle {}
class Bike extends Vehicle {}

public static void main(String[] args) {
    Van v = new Van();
    Bike b = new Bike ();

    System.out.println(v instanceof Vehicle);
    System.out.println(b instanceof SuperVehicle);
}
}
```

Figure 2.2:



```
Vehicle.java
1 interface SuperVehicle {}
2 // Наследование + Интерфейс (отношение IS-A)
3 class Vehicle implements SuperVehicle {}
4 class Van extends Vehicle {}
5 class Bike extends Vehicle {}
6
7 public static void main(String[] args) {
8     Van v = new Van();
9     Bike b = new Bike ();
10
11     System.out.println(v instanceof Vehicle);
12     System.out.println(b instanceof SuperVehicle);
13 }
14
15
```

Problems @ Javadoc Declaration Console

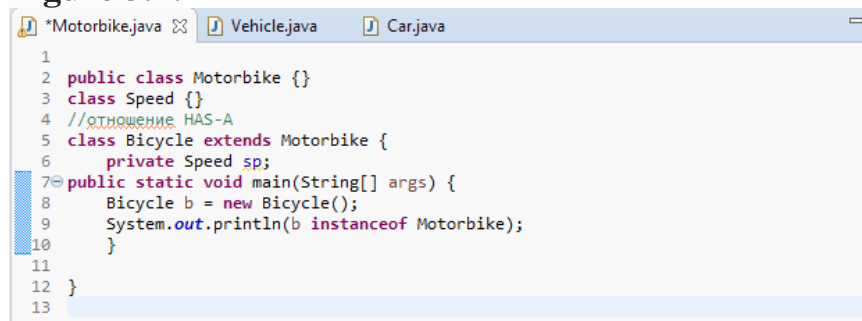
<terminated> Car [Java Application] C:\Program Files\Java\jdk-12.0.1\bin\javaw.exe (5 июн. 2019 г., 14:55:38)

true
true

Listing 3.1. (HAS-A Relationship):

```
public class Motorbike {}
class Speed {}
//отношение HAS-A
class Bicycle extends Motorbike {
    private Speed sp;
public static void main(String[] args) {
    Bicycle b = new Bicycle();
    System.out.println(b instanceof Motorbike);
}
}
```

Figure 3.2:



```
*Motorbike.java Vehicle.java Car.java
1
2 public class Motorbike {}
3 class Speed {}
4 //отношение HAS-A
5 class Bicycle extends Motorbike {
6     private Speed sp;
7 public static void main(String[] args) {
8     Bicycle b = new Bicycle();
9     System.out.println(b instanceof Motorbike);
10 }
11
12 }
13
```

References:

- ‘Automobile’ project files
- LMS materials