Course title: Network computing

Practical training № 2, 3. Classes.

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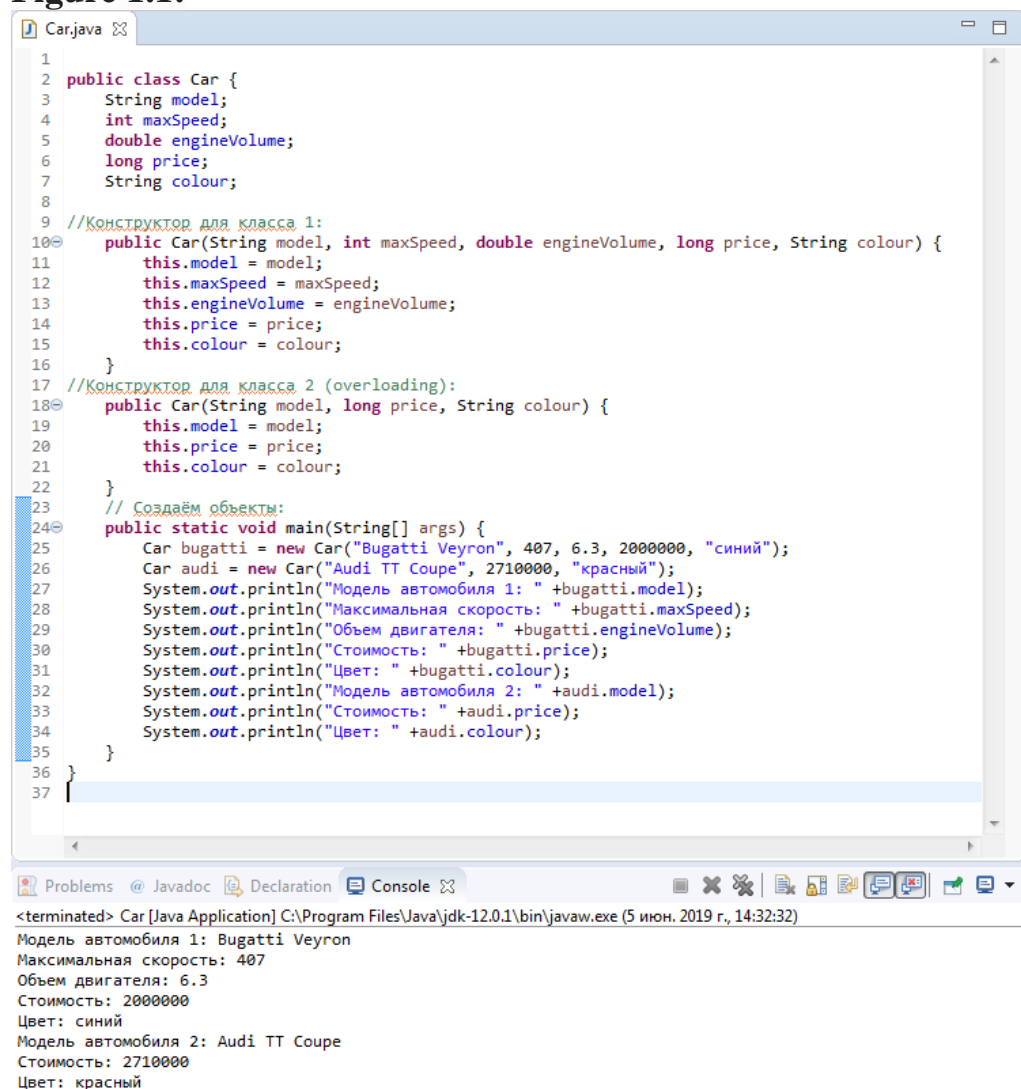
Date: 05.06.2019

Grade:

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:


```java
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);
    }
}
```

```
<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):

```java
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);
    }
}
```
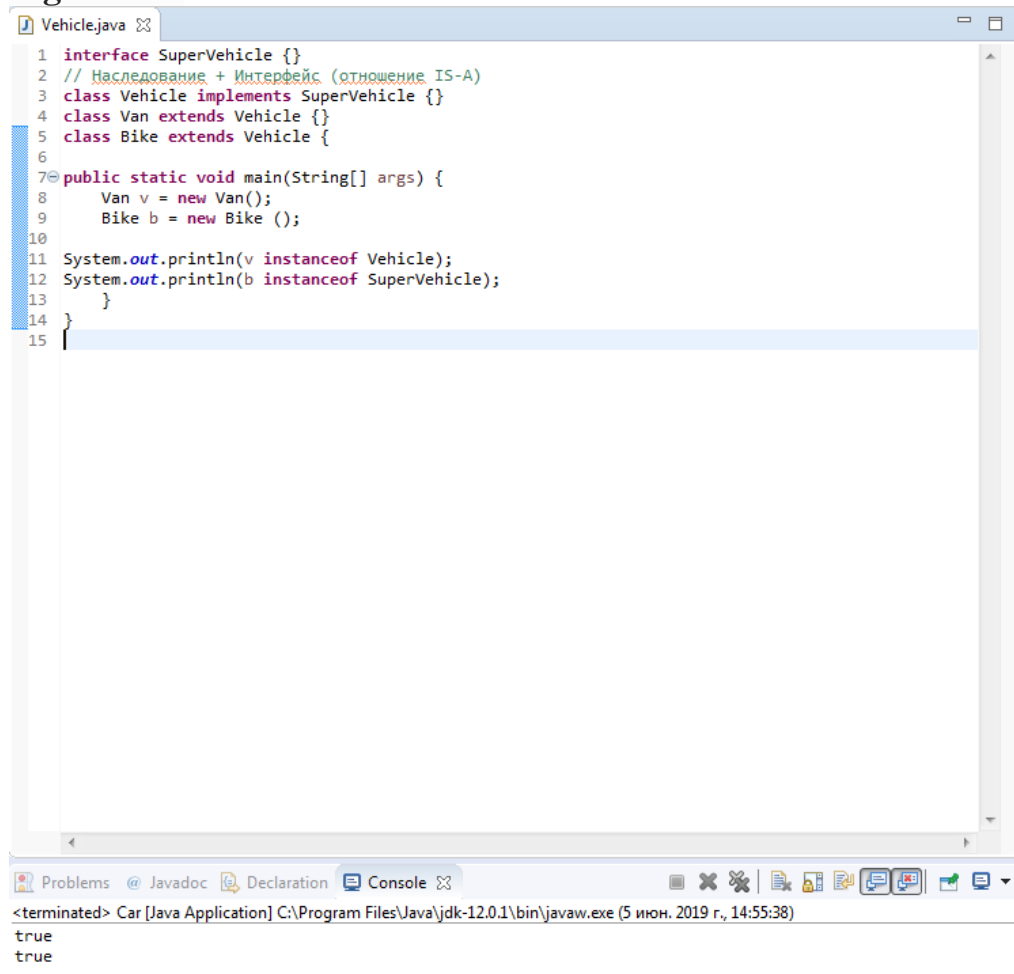
Listing 2.1. (IS-A Relationship):

```java
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:

```
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
```
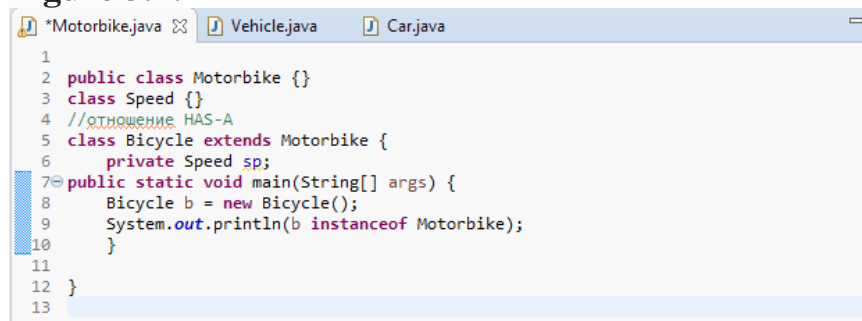
Problems   @ Javadoc   Declaration   Console ⊠

<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):

```java
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