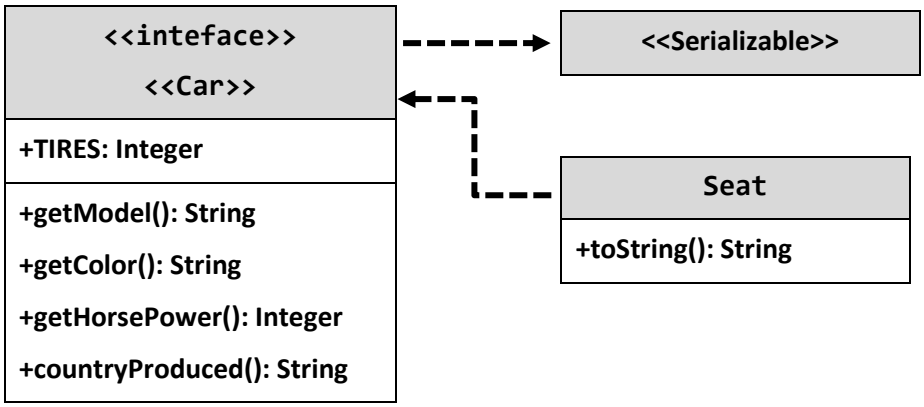
Lab: Interfaces and Abstraction

This document defines the lab for "Java OOP" course @ Software University. Please submit your solutions (source code) of all below described problems in Judge.

1. Car Shop

Build hierarchy from **classes** and **interfaces** for this UML diagram



Your hierarchy have to be used with this code

Main.java

```
public static void main(String[] args) {
    Car seat = new Seat("Leon", "gray", 110, "Spain");

    System.out.println(String.format(
            "%s is %s color and have %s horse power",
            seat.getModel(),
            seat.getColor(),
            seat.getHorsePower()));
    System.out.println(seat.toString());
}
```

Examples

Input	Output
	Leon is gray color and have 110 horse power This is Leon produced in Spain and have 4 tires

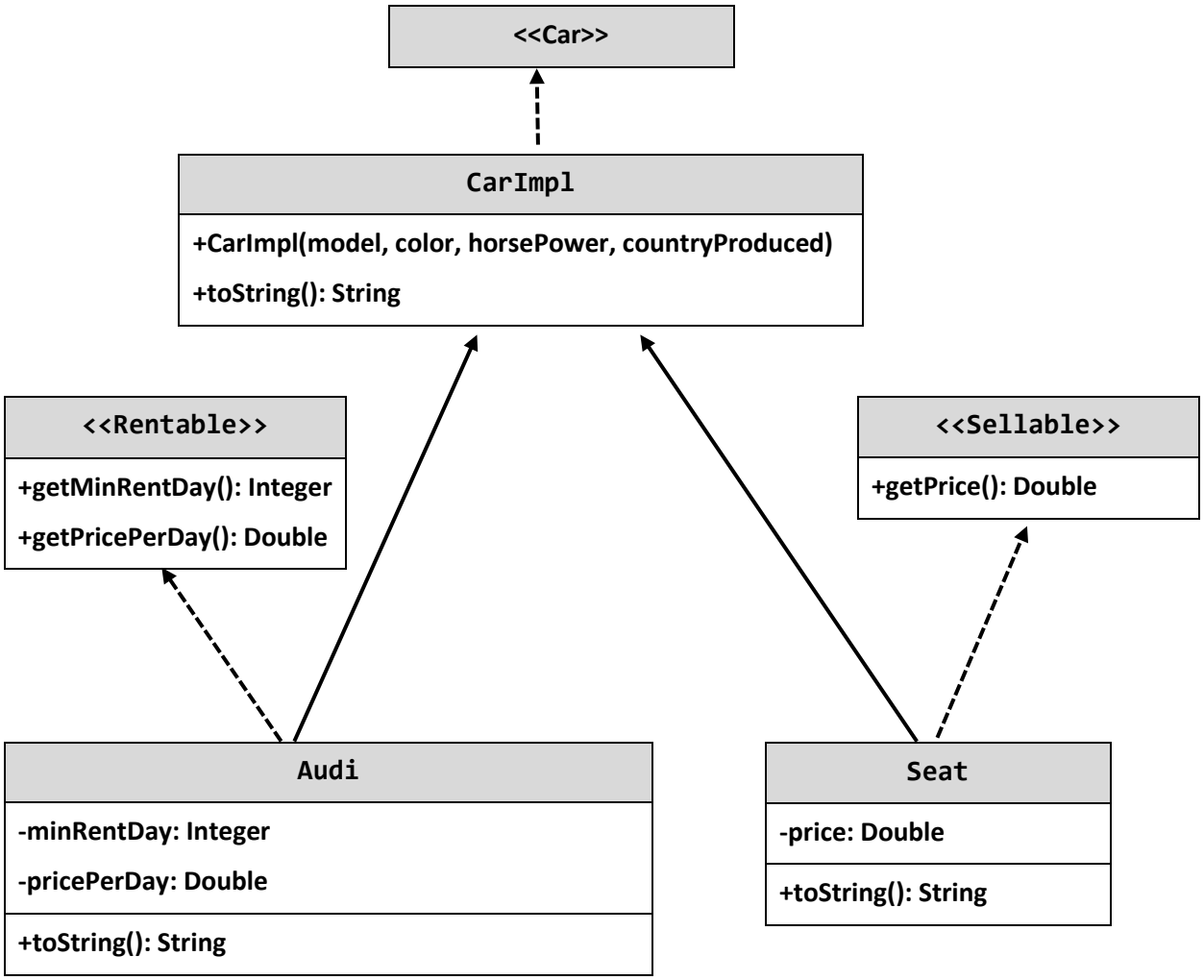
Solution

```
public interface Car {
    int TIRES = 4;

    String getModel();

    String getColor();

    Integer getHorsePower();
}
```

Note: consider using the wrapper classes in the **Seat** constructor.

2. Car Shop Extend

Extend previous problem:



Your hierarchy has to be used with this code

Main.java

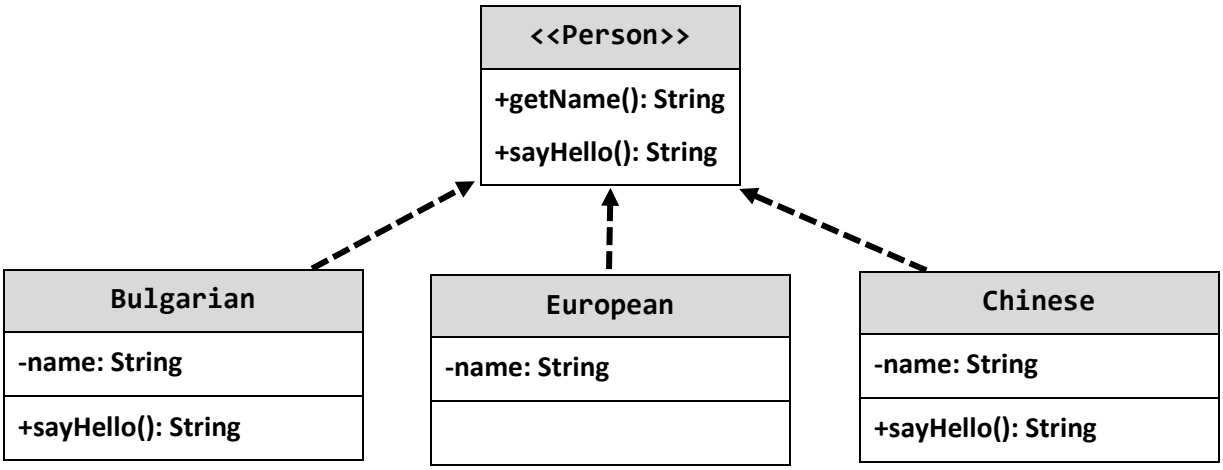
```
public static void main(String[] args) {
    Sellable seat = new Seat("Leon", "Gray", 110, "Spain", 11111.1);
    Rentable audi = new Audi("A4", "Gray", 110, "Germany", 3, 99.9);

    printCarInfo(seat);
    printCarInfo(audi);
}

private static void printCarInfo(Car car) {
    System.out.println(String.format(
            "%s is %s color and have %s horse power",
            car.getModel(),
            car.getColor(),
            car.getHorsePower()));
    System.out.println(car.toString());
}
```

Examples

Input	Output
	Leon is Gray color and have 110 horse power This is Leon produced in Spain and have 4 tires Leon sells for 11111,100000 A4 is Gray color and have 110 horse power This is A4 produced in Germany and have 4 tires Minimum rental period of 3 days. Price per day 99,900000

3. Say Hello

Build hierarchy from classes and interfaces for this **UML** diagram



Your hierarchy have to be used with this code

Main.java

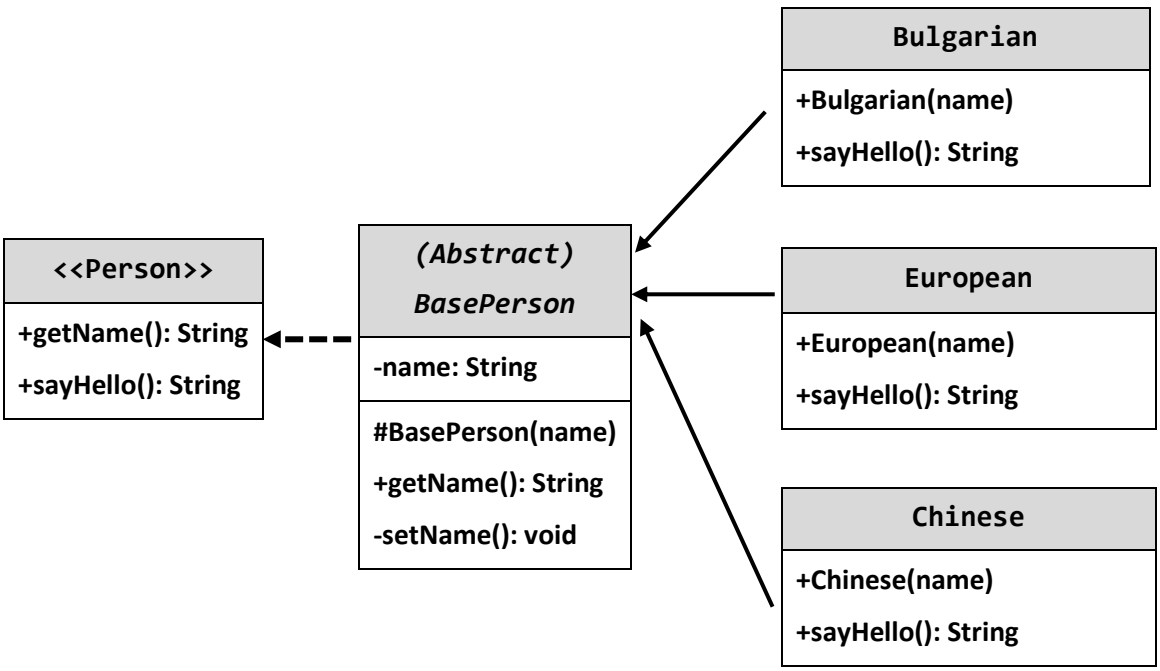
```
public static void main(String[] args) {
    List<Person> persons = new ArrayList<>();


    persons.add(new Bulgarian("Peter"));
    persons.add(new European("Peter"));
    persons.add(new Chinese("Peter"));

    for (Person person : persons) {
        print(person);
    }
}

private static void print(Person person) {
    System.out.println(person.sayHello());
}
```

Examples

Input	Output
	Здравей Hello Djydjybydjy

4. Say Hello Extend

Build hierarchy from classes and interfaces for this **UML** diagram



Your hierarchy have to be used with this code

Main.java

```
public static void main(String[] args) {
    List<Person> persons = new ArrayList<>();


    persons.add(new Bulgarian("Peter"));
    persons.add(new European("Peter"));
    persons.add(new Chinese("Peter"));

    for (Person person : persons) {
        print(person);
    }
}

private static void print(Person person) {
    System.out.println(person.sayHello());
}
```

Examples

Input	Output
	Здравей Hello Djydjybydjy

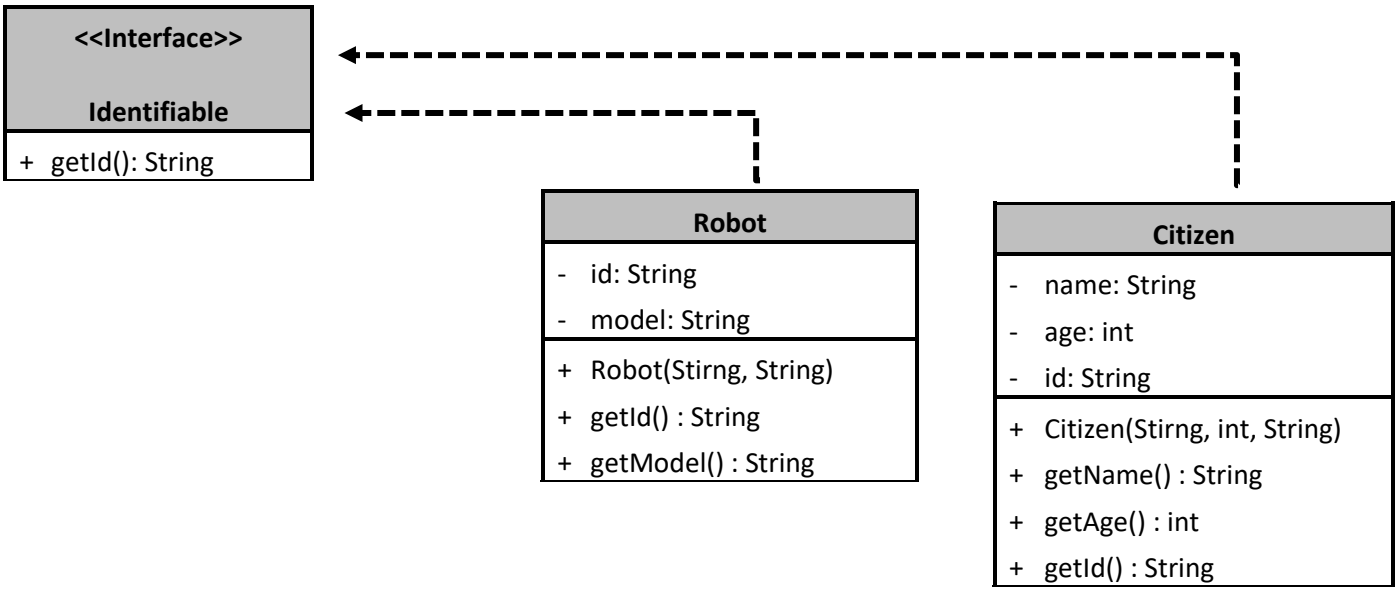
5. Border Control

It's the future, you're the ruler of a totalitarian dystopian society inhabited by **citizens** and **robots**, since you're afraid of rebellions you decide to implement strict control of who enters your city. Your soldiers check the **Id**s of everyone who enters and leaves.

You will receive from the console an **unknown** amount of lines until the command "**End**" is received, on each line there will be the information for either **a citizen** or **a robot** who tries to enter your city in the format **"<name> <age> <id>"** for citizens and "**<model> <id>**" for robots.

After the end command on the next line you will receive a single number representing **the last digits of fake ids**, all citizens or robots whose **Id** ends with the specified digits must be detained.

The output of your program should consist of all detained **Id**s each on a separate line (the order of printing doesn't matter).



Examples

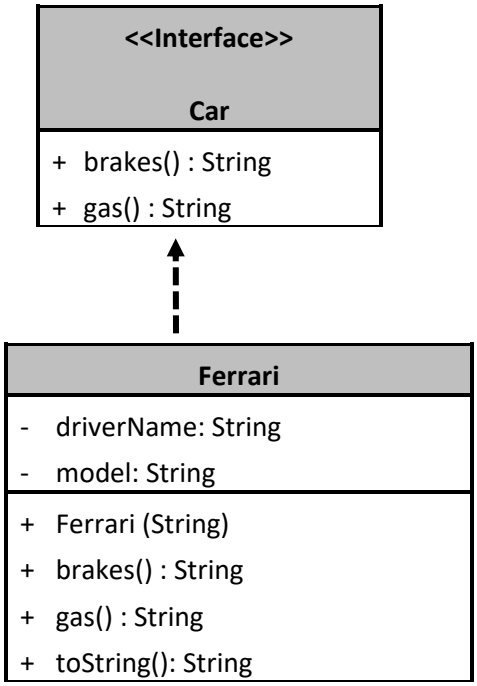
Input	Output
Peter 22 9010101122 MK-13 558833251 MK-12 33283122 End 122	9010101122 33283122

Teo 31 7801211340 Anna 29 8007181534 IV-228 999999 Simon 54 3401018380 KKK-666 80808080 End 340	7801211340

6. Ferrari

Model an application which contains a **class Ferrari** and an **interface**. Your task is simple, you have a **car - Ferrari**, its model is **"488-Spider"** and it has a **driver**. Your Ferrari should have functionality to **use brakes** and **push the gas pedal**. When the **brakes** are pushed down **print "Brakes!"**, and when the **gas pedal** is pushed down - **"Zadu6avam sA!"**. As you may have guessed this functionality is typical for all cars, so you should **implement an interface** to describe it.

Your task is to **create a Ferrari** and **set the driver's name** to the passed one in the input. After that, print the info. Take a look at the Examples to understand the task better.



Input

On the **single input line**, you will be given the **driver's name**.

Output

On the **single output line**, print the model, the messages from the brakes and gas pedal methods and the driver's name. In the following format:

"{model}/{brakes}/{gas}/{driver's name}"

Constraints

The input will always be valid, no need to check it explicitly! The Driver's name may contain any ASCII characters.

Example

Input	Output
Dominic Toretto	488-Spider/Brakes!/brum-brum-brum-brrrrr/Dominic Toretto
Brian O'Conner	488-Spider/Brakes!/brum-brum-brum-brrrrr/Brian O'Conner