

**Question 1 (2 Point)** Write a class named **Fan** that holds information of a fan.

Fan
-code:String -price:double
+Fan () +Fan(code:String, price:double) +getCode():String +getPrice():double +setPrice(price:double):void

Where:

- Fan() - Default Constructor.
- Fan(code:String, price:double) - Parameterized constructor, which sets values to code and price.
- getCode(): String – return code in **uppercase** format.
- getPrice(): double – return price.
- setPrice(price:double): void – update the value of price.

*Do not format the result.*

The program output might look something like:

<pre>Enter code: ab1 Enter price: 12 1. Test getCode() 2. Test setPrice() Enter TC (1 or 2): 1 OUTPUT: AB1</pre>	<pre>Enter code: ab1 Enter price: 12 1. Test getCode() 2. Test setPrice() Enter TC (1 or 2): 2 Enter new price: 20 OUTPUT: 20.0</pre>
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**Question 2 (3 Point)** Write a class named **Car** that holds information about a Car and class named **VNCar** which is derived from **Car** (i.e. Car is super class and VNCar is sub class).

Car
-name:String -price:double
+Car() +Car(name:String, price:double) +getName():String +getPrice():double +toString():String

Where:

- getName(): String – return name.
- getPrice(): double – return price.
- setPrice(price:double): void – update price.
- toString():String – return the string of format:

*name price*

VNCar
-series:int
+VNCar () +VNCar (name:String, price:double, series:int) +getSalePrice():double +toString():String

Where:

- getSalePrice(): double – return the value  $price1 = price + inc$ , where  $inc = 10\%$  of price if  $series < 300$ ,  $= 0$  otherwise.
- toString():String – return the string of format:

*name price series*

*Do not format the result.*

The program output might look something like:

<pre>Enter name: HoLa Enter price: 150 Enter series: 299 1. Test toString() 2. Test getSalePrice() Enter TC (1 or 2): 1 OUTPUT: HoLa    150.0 HoLa    150.0  299</pre>	<pre>Enter name: HoLa Enter price: 150 Enter series: 299 1. Test toString() 2. Test getSalePrice() Enter TC (1 or 2): 2 OUTPUT: 165.0</pre>	<pre>Enter name: HoLa Enter price: 150 Enter series: 300 1. Test toString() 2. Test getSalePrice() Enter TC (1 or 2): 2 OUTPUT: 150.0</pre>
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### Question 3 (3 Point)

Write a class named **Fan** that holds information about a fan.

Fan
-code:String -price:double
+Fan () +Fan (code:String, price:double) +getCode():String +getPrice():double +setCode(code:String):void +setPrice(price:double):void

Where:

- getCode(): String – return code.
- getPrice(): double – return price.
- setCode(code:String): void – update code.
- setPrice(price:double): void – update price.

*Do not format the result.*

The interface **IFan** below is already compiled and given in bytecode format, thus **you can use it without creating IFan.java file.**

```
import java.util.List;
public interface IFan {
    public void f1(List<Fan> t, String xCode);
    public int f2(List<Fan> t, double xPrice);
    public void f3(List<Fan> t);
}
```

Write a class named **MyFan**, which implements the interface **IFan**. The class **MyFan** implements methods **f1**, **f2** and **f3** in **IFan** interface as below:

- **f1**: Increase the price by 10% for those fans (in the list **t**) having code starts with **xCode** (see sample output).
- **f2**: count and return the number of fans (in the list **t**) having price  $\leq$  **xPrice**.
- **f3**: sort all fans (in the list **t**) ascendingly by price, in case their prices are the same, sort them ascendingly by their code alphabetically. *The sorting must ignore case during the comparison.*

In the **main()** function, the list **t** already contains some data and you can realize it from the output.

When running, the program output might look something like:

Enter code: HoLa1 Enter price: 60 Enter TC(1-f1;2-f2;3-f3): 1 The list before running f1: FS21            80.0 KS20            60.0 FF12            70.0 HoLa1           60.0 Enter xCode: F  OUTPUT: FS21            88.0 KS20            60.0 FF12            77.0 HoLa1           60.0	Add how many fans: 1 Enter code: HoLa1 Enter price: 60 Enter TC(1-f1;2-f2;3-f3): 2 The list before running f2: FS21            80.0 KS20            60.0 FF12            70.0 HoLa1           60.0 Enter xPrice: 70  OUTPUT: 3	Add how many fans: 1 Enter code: HoLa1 Enter price: 60 Enter TC(1-f1;2-f2;3-f3): 3 The list before running f3: FS21            80.0 KS20            60.0 FF12            70.0 HoLa1           60.0  OUTPUT: HoLa1           60.0 KS20            60.0 FF12            70.0 FS21            80.0
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**Question 4 (2 Point)** The interface **IString** below is already compiled and given in bytecode format, thus **you can use it without creating IString.java file.**

```
public interface IString {
    public int f1(String str);
    public String f2(String str);
}
```

Write a class named **MyString**, which implements the interface **IString**. The class **MyString** implements methods **f1** and **f2** in **IString** interface as below:

- **f1**: calculate and return sum of all digits in **str**.

- f2: return the string s, which is obtained by reading all characters in str, if a character is a digit between 0 and 8 then increase it by 1 (others characters are unchanged). E.g., if str="a01b2c8d9" then s = "a12b3c9d9"

The program output might look something like:

<pre> 1. Test f1() 2. Test f2() Enter TC (1 or 2): 1 Enter a string: a2bc3d5u OUTPUT: 10 </pre>	<pre> 1. Test f1() 2. Test f2() Enter TC (1 or 2): 2 Enter a string: a2bc9d5u8 OUTPUT: a3bc9d6u9 </pre>
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