NTOU Java Programing: Exercise 1

Spring 2024

SOSEL
Service-Oriented Software Engineering Lab

Exercise 1-1

- The formula for calculating BMI (Body Mass Index):

  BMI = weight (kilograms)

  / height (meters) × height (meters)

- The BMI evaluation methods from the Department of Health and Human Services/National Institutes of Health are:
  - *Underweight: < 18.5*
  - *Normal: >= 18.5 and < 25*
  - *Overweight: >= 25 and < 30*
  - *Obese: >=30*

Exercise 1-1₂

- Please create a BMI calculator that reads the user's weight in *kilograms (kg)* and height in *centimeters (cm)*, then calculates and displays the user's BMI and the evaluation result.
  - Note that a centimeter is defined as 1/100 meters

Example


```
Welcome to the BMI (Body Mass Index) calculator
Please enter your weight (kilograms): 70.5
Please enter your height (centimeters): 180.5
Your BMI is 21.6 (Normal)
```

(70.5 and 180.5 are input by the user; BMI is displayed to the first decimal place, so the displayed value is 21.6;

“Normally” is calculated according to the evaluation rules on the first page)

Problem Solving Tips

- Scanner: https://docs.oracle.com/en/java/javase/17/docs/api/java.base/java/util/Scanner.html
- Java if…else:
  - https://www.w3schools.com/java/java_conditions.asp

Exercise 1-2

- Create a class called Employee that includes three pieces of information as instance variables—a first name (type String), a last name (type String) and a monthly salary (type double).
  - Your class should have a constructor that initializes the three instance variables.
  - Provide a set and a get method for each instance variable. If the monthly salary is not positive, set it to 0.0.
- Write a test application named EmployeeTest that demonstrates class Employee's capabilities. (不須 Scanner)
  - Create two Employee objects and display the yearly salary for each Employee. Then give each Employee a 10% raise and display each Employee's yearly salary again.

Problem Solving Tips

- 1. Class Employee should declare three instance variables.
- 2. The constructor must declare three parameters, one for each instance variable. The value for the salary should be validated to ensure it is not negative.
- 3. Declare a public set and get method for each instance variable.
  - The set methods should not return values and should each specify a parameter of a type that matches the corresponding instance variable (String for first name and last name, double for the salary).
  - The get methods should receive no parameters and should specify a return type that matches the corresponding instance variable.

Example


```
Employee 1: Bob Jones; Yearly Salary: 34500.00
Employee 2: Susan Baker; Yearly Salary: 37809.00
Increasing employee salaries by 10%
Employee 1: Bob Jones; Yearly Salary: 37950.00
Employee 2: Susan Baker; Yearly Salary: 41589.90
```

(Please create two Employee objects in the EmployeeTest class, and assign the above listed attribute values)

(The execution result is expected to be the same as above)

Submission

- The naming should conform to the **CamelCase** style.
- “Package“ is required: ntou.cs.java2024.
- The first assignment only needs one class (BMICalculator).
- The second assignment must have two classes: one is the core class and the other is the test class (with the method “main”): Employee.java and EmployeeTest.java
- Please submit files including .java files and .class files (upload them to TronClass).
- Code failed to compile or execute is not accepted.