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# SCIT

School of Computing and Information Technology

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ASSIGNMENT 2 – PART I  
CSIT111– PROGRAMMING FUNDAMENTAL  
Session 3 – July to September 2023

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## INSTRUCTIONS TO CANDIDATES

1. The assignment consists of two parts. This is part 1 of the assignment.
2. Part 2 is Moodle quiz. Should be done in class.
3. The name of the program must be **YourName\_A2.java** (Only one file)
4. **Total mark of Assignment 2 is 10 marks; 4 marks for Part II.**

Your program, should begin with

```
// Full Name:  
// Java version: what version of java you used for this assignment.  
// Tutorial Group  
// JDK version:  
// Declaration: ..... tell me if it is your own work .... And whether you have  
// passed your program to your friends ...
```

### Objective

- Classes and Objects
- Composition classes
- Strings
- Enumeration data types
- Text Files
- **Avoid using static variables other than the constants. Private static methods are allowed ONLY in the main class.**

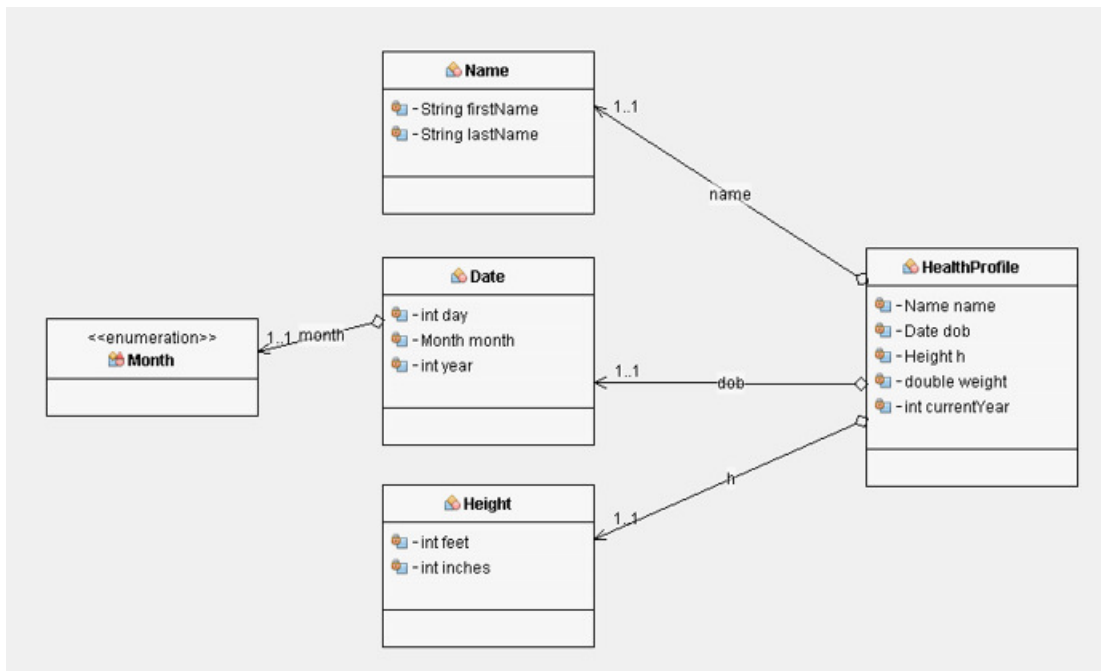
**Task (6 marks)**

While exercising, you can use a heart rate monitor to see that your heart rate stays within the range suggested by the trainers and doctors. The formula to calculate your maximum heart rate per minute is 220 (magic number☺) minus your age in years. Your target heart rate is a range that's 50 to 85% of your maximum heart rate.

When you supply your height (in meters) and the weight (in kg), you can compute your BMI. The formula is:

$$\text{Weight} / (\text{Height} * \text{Height})$$

Let us explore the following UML diagram:

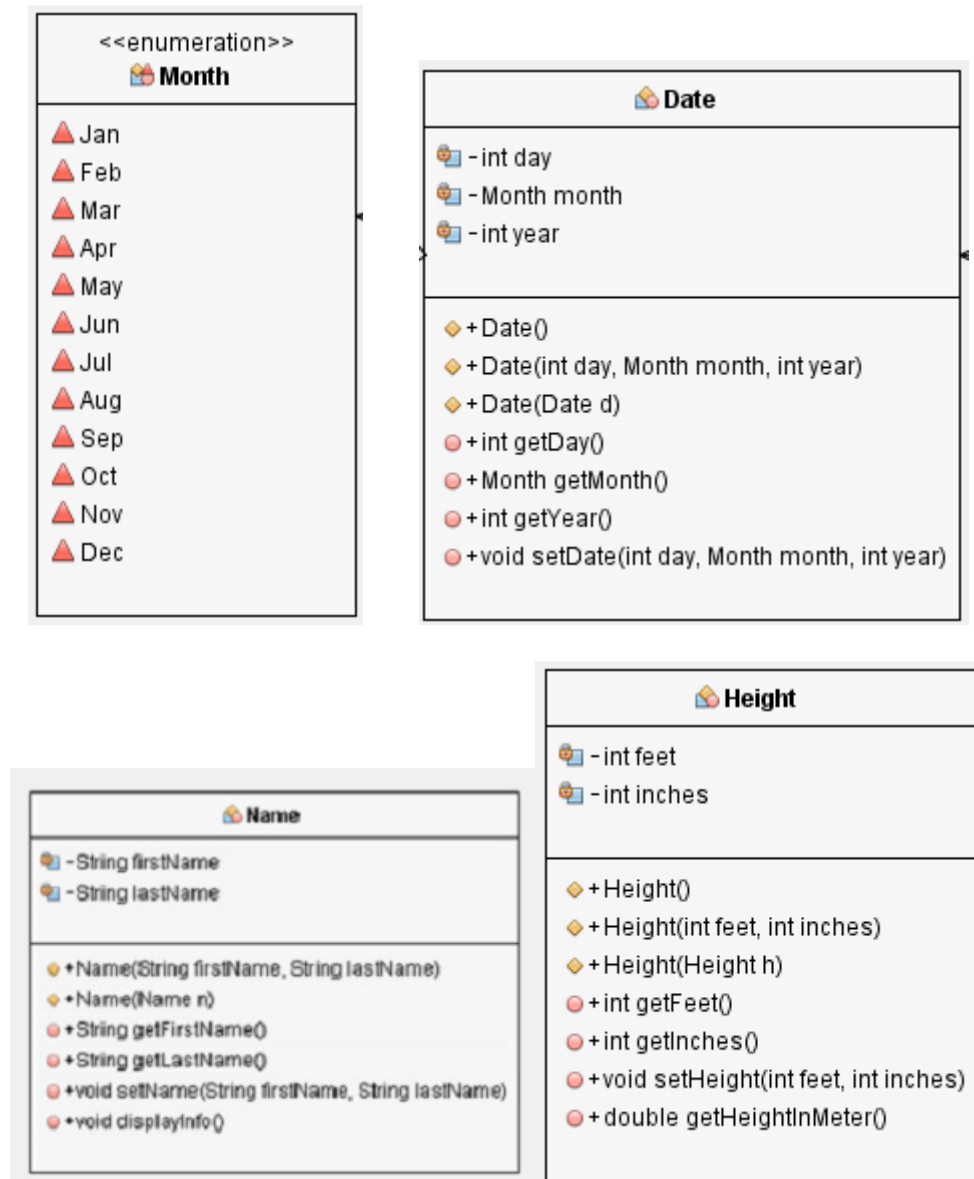


Design 5 classes

- An enumeration `Month` class consists of month constants from Jan to Dec.
- A `Name` class has a first name and a last name; i.e., are the two instance variables of this class.
- A `Date` class. Note that, other than the usual information for a calendar date i.e., private instance variables the day, the month (enum type), and the year; you have constructors, accessor and mutator methods. For the default constructor, initialize the date to 1<sup>st</sup> January 2023.
- A `Height` class has the same features as the `Date` class (constructors, accessor and mutator methods). Two private instance variables feet and inches. One important method is to convert the feet and inches and return its equivalent value in meter.
- A `HealthProfile` class has the same features as the `Date` class (constructors, accessor and mutator methods). Some important instance variables that you will see later in some UML diagram. You include also a few important methods related to the class; for example, get the maximum heart rate method, get the

minimum and the maximum of the targeted heart rate; compute and return the BMI; and a method to print out an object of this class.

Let us look at the detail UML diagram for each of the above classes:





You can see in the above UML diagram, HealthProfile class Name object, Date object, Height object, the weight, and the current year as instance variables. Other methods in the class are obvious by methods' names.

You construct a text file (using any text editor, for example notepad, named it as (“**input.txt**”) to store two persons' profiles. The sample format of this text file is:

```

Mohamed Ali
Bin Abdullah
15 Oct
1951
5 6      63.5
2023
Alan Richard
Heng
31
Dec
2005
6 8      98.8
2023
  
```

In reading information from the text file, you should treat each information as a *single* variable. For example, the date of birth has the day, the month, and the year; *and I may not put them all in one line of a text file.*

In the main method (defined in another class, for example, class Your\_Name\_A2), you read the information from the above text file and display the following output:

```
First patient
-----

Name: Mohamed Ali, Bin Abdullah
Date of birth: 15 Oct 1951
Your weight: 63.5 kg
Your height: 5 feet 6 inches; equivalent to: 1.68 meter
Current year: 2022
Your age: 71 years old
Clinic analysis, base on your age:
    1. Your maximum heart rate is 149
    2. Your minimum target heart rate is 74.50
    3. Your maximum target heart rate is 126.65
Your BMI 22.6
    Weight category      Range
    Underweight / too low  Below 18.5
    Healthy range         18.5 - 25
    Overweight            25 - 30
    Obese                  30 - 35
    Severe Obesity        35 - 40
    Morbid Obesity        Over 40

Second patient
-----

Name: Alan Richard, Heng
Date of birth: 31 Dec 2005
Your weight: 98.8 kg
Your height: 6 feet 8 inches; equivalent to: 2.03 meter
Current year: 2022
Your age: 17 years old
Clinic analysis, base on your age:
    1. Your maximum heart rate is 203
    2. Your minimum target heart rate is 101.50
    3. Your maximum target heart rate is 172.55
Your BMI 23.9
    Weight category      Range
    Underweight / too low  Below 18.5
    Healthy range         18.5 - 25
    Overweight            25 - 30
    Obese                  30 - 35
    Severe Obesity        35 - 40
    Morbid Obesity        Over 40
```

## IMPORTANT

Put all the classes in a Java file named **YourName\_A2.java** (remove the word **"public" from all classes**) and make sure that this file can be compiled and can be executed. Upload **ONLY** this file to Moodle. **ALL ZIP FILE SUBMISSION WILL BE REJECTED.** You don't have to upload the data file as you will demo to me (but name the sample testing text file as **"input.txt"** so that I can compile).

**No re-submission will be allowed after grading.**

In the above file, remember to put down your name and the following declaration (some similar contents):

**// Tell me if it is your own work, and whether you have passed your  
// program to your friends etc etc etc  
// and willing to accept whatever penalty given to you.**

- **Wrong file name -0.2 mark**
- **No declaration, no name etc -0.3 mark**
- **No demo -0.5**