Homework 5

100 Points

Classes

Project A: Rectangle
Project B: Patient Class // see next pages
Project C: Patient Class Report // see next pages

Grading

Create projects consisting of two or more files

Program 5A – 20

Program 5B
- Create the Patient class – 15
- Test the Patient class – 15

Program 5C
- Read data from an input file (**patient.txt**) into an array – 10
- Display to the screen the names of the underweight patients. – 5
- Display to the screen the names of the overweight patients. – 5
- Display to the screen the names of the obese patients. – 5
- Writes report to file (**patientReport.txt**) – 10

Create a projects consisting of two or more files – 10
Self Assessment Report – 5

Run each program as required and save the output at the end of the source file as a comment. Compress the source and header files, input and output files (if any), and the report file, and upload the compressed file: 22B_LastName_FirstName_H5.zip

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Project B: Patient Class

Write a definition of a class that has the following properties.

a. The name of the class is **Patient**.

b. The class **Patient** has the following member variables:
name (string), **height** (double), **age** and **weight** (int).

c. The class **Patient** has the following member functions:

setName – sets the name
setAge – sets the age
setWeight – sets the weight
setHeight – sets the height
getName – returns the name
getAge – returns the age
getWeight – returns the weight
getHeight – returns the height
display – outputs the data in the member variables in a nice format
weightStatus – returns a string according to the following chart (taken from: http://www.whathealth.com/bmi/formula.html)

BMI	Weight Status
Below 18.5	Underweight
18.5 -24.9	Normal
25 - 29.9	Overweight
30 & Above	Obese

The formula for BMI (body mass index) is given below:

$$BMI = (\text{weight in pounds} * 703) / (\text{height in inches})^2$$

d. Write definitions of all the member functions of class **Patient**.

Once you have written the class, write a separate program that creates three **Patient** objects named `patJane`, `patTim`, and `patLinda`, to hold the following data:

Name	Age	Height	Weight
Jane North	25	66	120
Tim South	64	72	251
Linda East	52	69	175

The program should store data in these objects (call the setter functions to assign these values: do not prompt the user to enter anything) and then display the data for each patient to the screen (name, age, height, weight, and weight status) in label format as shown below:

Name: Jane North
Age: 25
Height: 66 inches
Weight: 120 pounds
Weight Status: Normal

Note: For one of the objects use the getter functions. For the other two objects call the display() member function. Do not use an array of objects (you will use one in 5C).

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Project C: Patient Class Report

This program will create an array of 100 **Patient** objects and it will read data from an input file (**patient.txt**) into this array. Then it will display on the screen the following:

1. The names of the underweight patients.
2. The names of the overweight patients.
3. The names of the obese patients.

Finally, it writes to another file (**patientReport.txt**) a table as shown below:

```
Weight Status Report
==================== === ====== ====== ============
Name                 Age Height Weight Status
==================== === ====== ====== ============
Jane North            25   66     120   Normal
Tim South             64   72     251   Obese
.
.
.
==================== === ====== ====== ============
Number of patients: 5
```

Assume that a name has at most 20 characters (for formatting). Write several small functions (stand-alone functions). Each function should solve a specific part of the problem.

On each line in the input file there are four items: age, height, weight, and name. Test your program using the following data (input file: **patient.txt**)

```
25 66 120 Jane North
64 72 251 Tim South
52 69 175 Linda East
31 71 122 Paul West
42 65 130 Mary Jane Doe
19 71 150 Victor Smith
22 67 135 Mary Johnson
39 73 229 Tom Baker
26 68 133 Diana Newman
54 70 215 William Peterson
28 68 143 Jim Gaddis
42 67 115 Laura King
33 71 162 Ann McDonald
52 75 270 Peter Pan
29 70 144 George Paul Lucas
23 66 135 Monica T. Potter
69 72 254 Andrew Davis
```