INT101 Midterm Exam 2021/1
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A. Implement **Q01StaticMethod** class as follow:

1. Write the following two static methods:
   - 1.1) a static method (using your first name as the name of this method) to convert a length in meters to a length in wah where 1.0 meter = 0.5 wah (ratio). This method receives a length in meters and returns an equivalent length in wah.
   - 1.2) a static method (using your last name as the name of this method) to convert a length in yards to a length in meters where 1 yard = 0.91 meter (ratio). This method receives a length in yards and returns an equivalent length in meters.
2. In the static main method,
   - 2.1) let **xxx** be a variable of type double and set its value to be the last three digits of your student id,
   - 2.2) print the value of **xxx** out using **System.out.println()**,
   - 2.3) converts **xxx** meters to wah and print the result out using **System.out.println()**,
   - 2.4) converts **xxx** yards to wah and print the result out using **System.out.println()**.
3. Run this class, screen capture the output of this program, and place the output image in the answer.

Note:

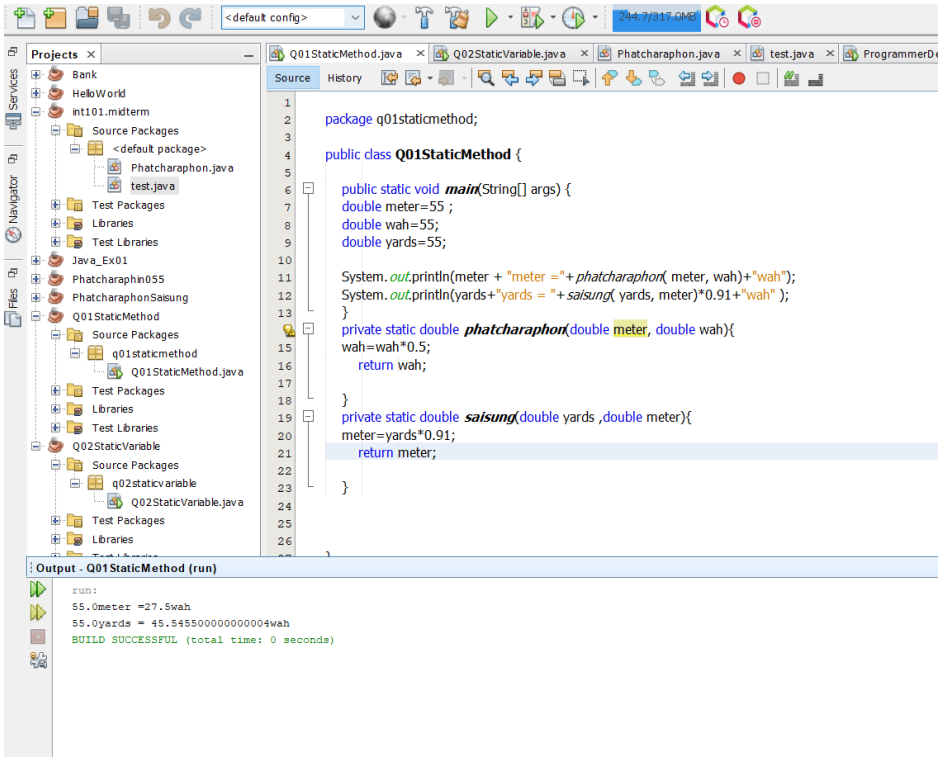
You must do all the calculation programmatically without doing any part manually or by using a calculator. <u>All ratios must be set as constants locally in the methods</u>.

You must use the naming conventions for all constants, variables, and methods.

In your submission, there must be 4 java source code files:

Q01StaticMethods.java, **Q02StaticVariable**.java, ***YouFirstName***.java, and ***YourLastName***.java and a pdf file containing screen capture output from Part A, B, and C.

Zip all 5 files into one zip file (.zip).



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B. Implement **Q02StaticVariable** class as follow:

1. Define a static constant in this class to represent the following ratio: 1.0 acre = 2.529 rai.
2. Write the following two static methods:
   2.1) a static method (using the first three letters of your first name as the method name) to convert an area in acres to an area in rai.
   This method receives an area in acres and returns an equivalent area in rai.
   2.2) a static method (using the last four letters of your last name as the method name) to convert an area in rai to an area in acres.
   This method receives an area in rai and returns an equivalent area in acres.
3. In the static main method,
   3.1) let **xxx** be a variable of type double and set it value to be the last three digits of your student id,
   3.2) print the value of **xxx** out using **System.out.println()**,
   3.3) converts **xxx** acres to rai and print the result out using **System.out.println()**,
   3.4) converts **xxx** rai to acres and print the result out using **System.out.println()**.
4. Run this class, screen capture the output of this program, and place the output image in the answer.

Note:

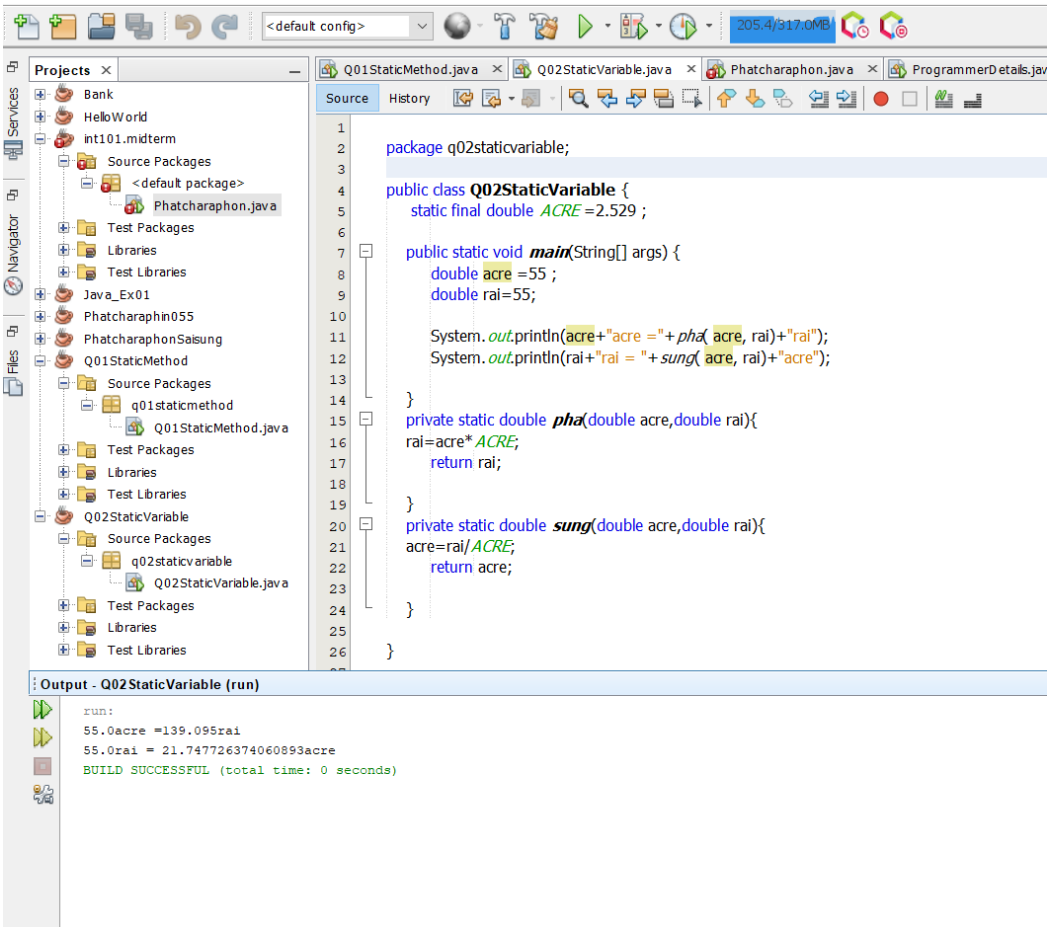
You must do all the calculation programmatically without doing any part manually or by using a calculator. All ratios must be set as constants locally in the methods.

You must use the naming conventions for all constants, variables, and methods.

In your submission, there must be 4 java source code files:

Q01StaticMethods.java, **Q02StaticVariable**.java, ***YouFirstName***.java, and ***YourLastName***.java and a pdf file containing screen capture output from Part A, B, and C.

Zip all 5 files into one zip file (.zip).



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C. Implement a class named after your firstname, in a package named **int101.midterm**, as follow:

1. This class contains the following three private instance variables (of type double) named: mass (in grams), volume (in cc), and density (in g./cc.) where density cannot be changed.
2. Write the following public non-static methods:
   - 2.1) A **constructor** that receives a mass and a volume to set its internal states (i.e., mass and volume). The density is set to mass/volume (i.e., mass divided by volume).
   - 2.2) A **constructor** that receives a density to set its internal state. Its internal states which are the mass and the volume are set to 0.
   - 2.3) Three **getter** methods, one for each field (i.e., mass, volume, density).
   - 2.4) Two **setter** methods, one for mass and the other for volume. Note that when the mass or the volume is changed, the other must be updated accordingly to preserve the density.
   - 2.5) One **toString()** method to return a string containing its mass, volume, and density.
3. Create another class named after your lastname, not in any package, and create a public static void main method that does the following:
   - 3.1) Create two objects from this class: one from each constructor. You may set any different positive numbers as the mass, the volume, and the density.
   - 3.2) Print both objects out using **System.out.println()**.
   - 3.3) Call the mass setter on one object and call the volume setter on the other object.
   - 3.4) Print both objects out using **System.out.println()**.
4. Run the class that named after your lastname, screen capture the output of this program, and place the output image in the answer.

Note:

You must do all the calculation programmatically without doing any part manually or by using a calculator. All ratios must be set as constants locally in the methods.

You must use the naming conventions for all constants, variables, and methods.

In your submission, there must be 4 java source code files:

Q01StaticMethods.java, **Q02StaticVariable**.java, ***YouFirstName***.java, and ***YourLastName***.java and a pdf file containing screen capture output from Part A, B, and C.

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