CMSC21 Lab Exercise 8 – More Top Down Design

Following the design recipe, create the following functions. Do not remove the stub and template after completing the function; just leave it commented out.

Design recipe steps:

1. Signature, purpose and stub
2. Define examples
3. Template and inventory (create constants)
4. Code the function body
    a. While making the body for the big problem, see if it can be split up into smaller subproblems.
    b. "Wish" for the additional functions you need.
    c. Design the functions in the wishlist. When the wishlist is empty, you're done!
5. Test and debug until correct

Testing:

-   Create a complete set of test cases for each category of inputs
-   Include all boundary cases
-   Show that there is 100% code coverage

1. Create a function that determines whether a student passes or fails a subject given his final exam score and his current class standing. The final exam has a total of 150 points. The class standing comprises 80% of the final grade while the final exam comprises 20%. Passing final grade is 60%.

2. Create a function that calculates the appropriate fare for a group of people given the number kilometers travelled. Fare rate: Php7.50 for the 1st five kilometers and additional Php0.75 for each succeeding kilometer. (Note: no one gets discounts.)

3. Create a function that determines whether a line, denoted by two points, is horizontal. A horizontal line has a slope of 0. Here's the formula for slope:

$$slope = \frac{y2 - y1}{x2 - x1}$$

Represent the line as two Points, where a Point is a struct of two ints. (BONUS: You don't need a Line struct, but you could define it if you wish.)