ITEC 109: Problem Solving and Programming

Homework 3a: Elemental Monster Testing

>>>>>>>> Due Date: Wednesday, November 30th at 10:00 PM via D2L <<<<<<<

In doing this homework, remember to abide by the RU Honor Code. This is not a group assignment

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Problem 1
96 points

Your goal is to create part of a game engine that is targeted at a casual audience. It deals with monsters of different element types that battle each other. Instead of drawing out the battle process by displaying each hit during a battle, the new game will just tell the user whether or not their character won or lost the battle. Your job is to provide the engine for calculating the winner of the battle.

The element attributes of each monster are the hallmark of this game. They are earth, fire, and water. Earth is strong against fire but weak against water. Water is strong against earth, but weak against fire. Fire is strong against water, but weak against earth. Being strong against an element means that you deal 20% more damage per hit. Being weak means that you deal 20% less damage per hit.

Input
In addition to their elemental type, monsters have a certain number of HP, and the amount of damage their attack does. The input format for each monster is Type|HP|AttackDamage.

Computation
Your program must calculate how many hits it takes for each monster to destroy the other monster. Each attack used subtracts its damage amount from the other monster's HP while taking into account the elemental strengths and weaknesses. Make sure you round up whenever calculating the number of hits it takes to defeat a monster. With the number of hits to destroy the other monster, you will be able to determine the winner for the battle (the winner is stronger than the loser).

Output
First, the elemental advantage must be printed if it exists. The format of the message must be one of the following three options:

- There are no elemental advantages in this battle
- Monster 1 has an elemental advantage over Monster 2
- Monster 2 has an elemental advantage over Monster 1

Next, in order to determine which monster is the strongest, one of the following messages must be printed out:

- Monsters are of equal strength
- Monster 1 is stronger than Monster 2
- Monster 2 is stronger than Monster 1

Sample usage scenario 1:
Enter the 1st monster's information
Water|30|4
Enter the 2nd monster's information
Fire|30|4
Monster 2 has an elemental advantage over Monster 1
Monster 2 is stronger than Monster 1

Sample usage scenario 2:
Fire|30|4
Enter the 2nd monster's information
Fire|30|4
There are no elemental advantages in this battle
Monsters are of equal strength

Hint: you may want to add debug output that prints out how many hits it takes to defeat the other monster to determine if your code is working properly.

Constraints:
You must use at least four functions in your program. Note, they must be well designed not simply functions that print out a statement and then return.

The reference solution for this project is 85 lines of code. Feel free to use more or less code in your solution. This number is provided to help you gauge the difficulty of the assignment.

Submission requirements:
You must submit the file containing your program to D2L under the Homework #3 folder. If your submitted file does not run, it will receive a 0.

Grading Rubric
50 Points - Does it properly display which monster won?
46 Points - Are functions properly used in the program?