ITEC 120: Principles of Computer Science I

Homework 4: Elemental Monster Testing

>>>>>> Due Date: Friday, February 11th at 10:00 PM via Desire2Learn <<<<<<

In doing this homework, remember to abide by the RU Honor Code.

Problem 1
15 points

Given your success with the World of Wyverns testing programs, you have been tasked with a role in creating a game targeted at a more casual audience. It deals with monsters of different element types that battle each other. Instead of drawing out the battle process by going hit by hit, the new game will just tell the user whether or not their monster 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 a monster deals 20% more damage per hit. Being weak means that the monster deals 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. 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 wins, 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 submit at least one test case that is not included in this specification when you submit your program. Use the Desire2Learn comment functionality when submitting the assignment. You must use at least four functions other than main in your program.

No fields, instance, or class variables may be used in this program. If you don't know what they are, don't worry about it. The purpose for this rule is to make sure you must pass information through the program with parameters.

The reference solution for this project is 85 lines of code without comments. 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 .java file containing your program to Desire 2 Learn under the Homework #4 folder. If your submitted file does not compile, it will receive a 0. You can demo the homework the next school day after it is due, or it will be graded automatically. If you choose not to demo your homework you cannot contest the grade you receive.

Grading Rubric
10 Points - Does it properly display which monster won?
3 Points - Are functions properly used in the program?
2 Points – Did you submit a valid test case with your program?