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Project 3 Design and Reflection

Design:

The problem for this project is creating a fantasy combat game that simulates a fight between two characters, both derived from an abstract base class, with different properties and special abilities. The game is based on user input handled by a menu class with input validation to allocate memory for 2 characters of the player's chosen type – Barbarian, Blue Men, Harry Potter, Medusa and Vampire – that alternate attacking and defending via dice rolls indicating attack and defense points until one character's health is depleted.

My goal to address this problem is to create a Game class with a constructor that assigns pointers to the derived classes to two data members that are pointers to the base class, Character. This will allow me to pass these pointers to functions that display needed stats during each attack and defense, roll dice, and call the correct virtual functions for attack and defend to correctly assess outcomes of fights involving derived classes with special abilities.

Test Plan:

Test Case	Input Value	Expected Result	Actual Result
Input validation tested from Project 1	Multiple	Prompt is repeated for invalid data	Prompt is repeated for invalid data
Characters start the fight	N/A	Displayed properties match values from derived class constructors	Displayed properties match values from derived class constructors
Character 1 attack exceeds armor and defense of character 2		Character 2 strength is decreased by the difference	Character 2 strength is decreased by the difference
Vampire defense plus armor is less than attacker's points	N/A	Inflicted damage should randomly be 0	Inflicted damage should randomly be 0
Medusa rolls a 12	N/A	Other fighter dies	Other fighter dies
Harry Potter dies	N/A	Harry Potter is revived once	Harry Potter is revived once
Blue Men strength is decreased by 4 or 8	N/A	Random dice rolls do not exceed the adjusted number of dice	Random dice rolls do not exceed the adjusted number of dice

Reflection:

In my original design, I hadn't accounted for a variable in the character class to set the "type," or the name of the character to display to the user to avoid confusion during attacks, especially involving those with two characters of the same class. This was resolved by later adding a string data member for type, which was set in the constructor for each derived class. Another difficulty was correctly handling Medusa's glare special ability. Since the attack points are displayed in the fight function, not the output of a dice roll, it was difficult to show that the dice roll was 12 when the attack points had to be sufficient to set the other fighter's strength to 0. I chose to change the wording on the displayRoll function to use the terms "hit points" and "defense points," rather than roll, so it was implied that the glare took effect if the hit points displayed as 1,000 following one of Medusa's attacks.