Project 3

Design:

Creature class

- Protected data members for name(type), armor, and strength points
- Pure virtual destructor and 2 getter member function
- Pure virtual functions for attack, defense, and damage
- Enumeration declaration of Special Abilities

Vampire class

- Inherits from Creature class
- Private data members for attack and defense values
- Constructor that assigns unique values to type, armor, and strength points and seeds a random number generator
- Override defense and damage function
    - If defense roll was greater than 3, then Vampire uses Charm to reduce upcoming damage to 0.

Barbarian class

- Inherits from Creature class
- Private data members for attack and defense values
- Constructor that assigns unique values to type, armor, and strength points and seeds a random number generator

Medusa class

- Inherits from Creature class
- Private data members for attack and defense values
- Constructor that assigns unique values to type, armor, and strength points and seeds a random number generator
- Override attack function
    - If attack roll is equal to 12, then Medusa uses Glare to increase attack value to 1000.

Blue Men class

- Inherits from Creature class
- Private data members for attack and defense values
- Constructor that assigns unique values to type, armor, and strength points and seeds a random number generator
- Override defense function
    - For every 4 points of strength points lost, Blue Men uses Mob and loses 1 defense die

Harry Potter class

- Inherits from Creature class
- Private data members for attack and defense values
- Constructor that assigns unique values to type, armor, and strength points and seeds a random number generator
- Override damage function
    - If strength points were equal to or less than 0, then Harry Potter uses Hogwarts and revives with its strength points equal to 20. This only happens once per game.

Arena function

- Takes in two Creature pointers through its parameter
- Player 1 always has the first turn
- Displays values for attack and defense function for each player turn
- Displays remaining strength points at the end of each round
- Fight continues until one creature has a strength point equal to or less than 0
- Displays the winner

Menu function

- Create two Creature pointers
- Displays menu list
- Displays different creatures to pick from
- Prompts user to enter an integer for the creature each player wants
- Calls arena function

Main function

- Calls menu function

Problems encountered:

There were three main problems that occurred during implementation of this project. The first problem was with pure virtual deconstructor and I couldn't get my program to compile. I was unsure of the proper way of writing a pure virtual deconstructor but I was able to resolve this issue by defining it in the base class instead of the cpp file. Another issue that I had was my attack and defense functions weren't changing values per turn. I was stuck on this issue for a while until I attended one of the TA's where they explain to me the limits of the random number generation srand(time(0)). I was able to resolve this issue by seeding the random number generation in the derived class's constructors instead of the attack and defense function. The last major problem I had with this assignment was trying to find a logic sequence that would loop the two creatures fighting each other until one of their strength points was less than or equal to 0. Through many experiments I found a statement that would terminate the loop if one creature had a strength points less than or equal to 0. I achieved this by using the && operator.

Test Plan for Creatures Results

Test Case: All Fighters versus Barbarian	Creature Objects	Expected Outcome(From 5 test runs)	Actual Outcome(From 5 test runs)
V vs B	Vampire vs Barbarian	Vampire will win more	Vampire won 4 out of 5 runs
B vs B	Barbarian(player1) vs Barbarian(player2)	Barbarian(player1) will win more	Barbarian(player2) won 3 out of 5 runs
BM vs B	Blue Men vs Barbarian	Blue Men will win more	Blue Men won 5 out of 5 runs
M vs B	Medusa vs Barbarian	Medusa will win more	Barbarian won 4 out of 5 runs
HP vs B	Harry Potter vs Barbarian	Harry Potter will win more	Harry Potter won 4 out of 5 runs