

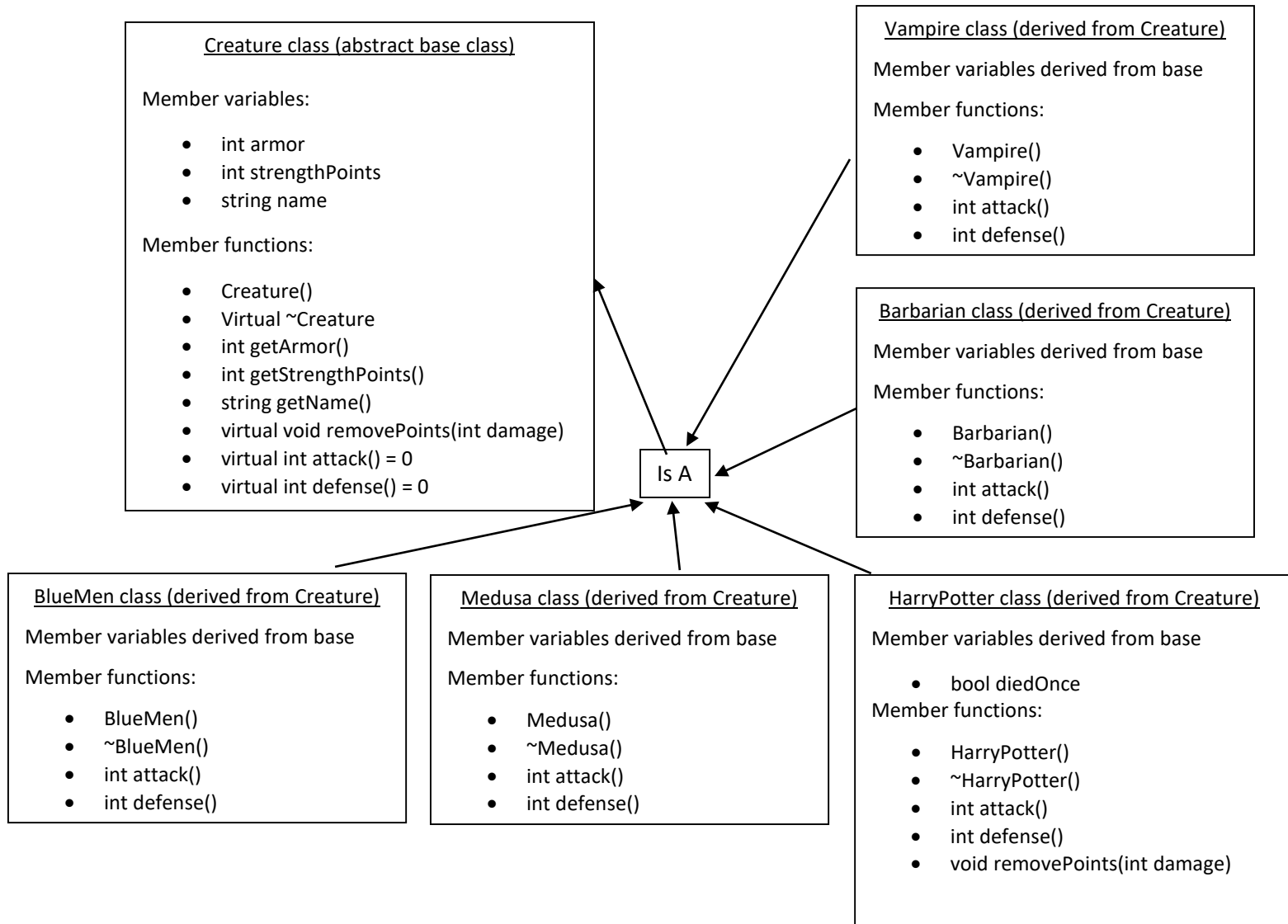
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CS 162 W17

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Project 3 Reflection

Project Plan



Design Ideas

- Destructor is virtual so that there are no memory leaks
- Define getArmor(), getStrengthPoints(), and getName() all in abstract base class
- Define removePoints() in base class but make it virtual so that HP can override it for Hogwarts ability
- Attack() and defense() are pure virtual functions that must be defined in derived class
- Use die objects to calculate attack() and defense() for each creature
- Define Medusa's Glare as attack = 0, and define Vampire's Charm as defense = 0
- Use rand() % 2 to determine who goes first and when Vampire uses charm

How my Design Changed

- I hadn't accounted for attacks having a negative value, which adds to the defender's score. I had to add code to main that would change any negative attacks to be 0.
- Similarly I had to add code to removePoints() that would check to see if the creature's strengthPoints was negative. I changed negative strengthPoints to 0 so that the logical statements in main would work better. It also made sense for Harry Potter, since he gets revived once.
- At first I created 5 pointers at the beginning of the program, one for each creature, but I realized that it wouldn't work when 2 creatures of the same type are fighting one another. So I changed it to having 2 pointers (player1 and player2) that would be deleted after each game.
- I tried to implement Harry's Hogwarts ability without a bool, but it made the main method too messy so I just added a bool member variable to the HarryPotter class

Test Plan

Expected Outcomes:

- Vampire will win often thanks to Charm and high strength points
- Blue Men will win the most thanks to a high attack, defense, and armor. Mob doesn't weaken them that much until they are down to 4 strength points
- Harry Potter will win often thanks to Hogwarts ability and high strength points
- Medusa will win if they get lucky (Glare) but their low strength points can cause them to lose despite their high defense and armor
- Barbarian is the weakest one and will lose most often

Test Plan

| Player 1 | Player 2 | Expected Outcomes | Observed Outcomes |
|-----------|--------------|---|---|
| Vampire | Vampire | Long game due to Charm | Game took 15 turns, many charms |
| Vampire | Barbarian | Vampire wins thanks to Charm | Vampire won and used 3 Charms |
| Vampire | Blue Men | Blue Men will win due to their high attack | Blue Men won in 1 turn (attack 19 defense 1) |
| Vampire | Medusa | Vampire will win because it beats Glare, but it will be slow due to Charm and Medusa's armor | Vampire won in a long match, Charm and Medusa's armor made it take 22 turns total |
| Vampire | Harry Potter | Harry Potter will win thanks to Hogwarts | Harry Potter won with 19 strength points left |
| Barbarian | Vampire | Vampire will win because Barbarians are weak | Vampire won with 9 strength points left |
| Barbarian | Barbarian | Long and boring match, both are pretty weak | Took 15 turns for match to end |
| Barbarian | Blue Men | Blue Men will win thanks to high attack | Blue Men won in 6 turns |
| Barbarian | Medusa | Medusa will win thanks to armor and maybe Glare | Barbarian won, Medusa rolled very low defenses |
| Barbarian | Harry Potter | Harry Potter will win thanks to Hogwarts | HP won with 19 strength points left |
| Blue Men | Vampire | Blue Men will win because their high attack and defense will be more of an advantage than Charm | Blue Men won easily, even though Vampire had several Charms |
| Blue Men | Barbarian | Blue Men will win easily thanks to high attack | Blue Men won with 12 strength points left |
| Blue Men | Blue Men | Short game, winner will have high attacks | Winner had attacks of 19 and 17 |
| Blue Men | Medusa | Blue Men will win, too powerful | Blue Men won thanks to high defense and armor |

| | | | |
|-----------------------------------|--------------|--|--|
| Blue Men | Harry Potter | Blue Men will win, they are stronger than Harry | Blue Men won, Harry used Hogwarts early |
| Medusa | Vampire | Vampire will win with help from Charm | Vampire won in just 4 turns thanks to Charm and high attack |
| Medusa | Barbarian | Medusa will win, high armor will make difference | Medusa won pretty easily |
| Medusa | Blue Men | Blue Men win as always | Blue Men won in 2 turns |
| Medusa | Medusa | Might see a glare, but if not a long boring match | Glare happened! Only 6 turns for this match |
| Medusa | Harry Potter | Harry Potter wins thanks to Hogwarts | HP won with 20 strength points left |
| Harry Potter | Vampire | Harry Potter will win because of Hogwarts | HP just barely won with 4 strength points left in his second life |
| Harry Potter | Barbarian | Harry Potter wins easily | HP wins with 18 strength points left |
| Harry Potter | Blue Men | Blue men win because they are too powerful | Blue Men won with 12 points left |
| Harry Potter | Medusa | Harry Potter will win easily | HP won with 20 strength points left |
| Harry Potter | Harry Potter | Long match due to both players having Hogwarts | Player 2 won in 42 turns and had 9 strength points left |
| Charm 50% of the time | | Expect Charm about half the time | Charm happens just under 50% of the time when a Vampire is in play |
| Player 1 goes first half the time | | P1 and P2 go first pretty evenly | They each go first ~50% of the time |
| Glare happens rarely | | See it a couple times, only should happen 2.8% of the time | Saw it happen once, but Medusa lost almost always |

Test Results

My test results largely matched my expected outcomes:

- Blue Men was the strongest, by quite a margin, never lost
- Harry Potter and Vampire were the next 2 strongest, both usually won
- Medusa and Barbarian are the 2 weakest as expected, though they were closer than I thought with just a they would be.
- Medusa and Barbarian each won just once against different characters – when they played each other. Lost to Blue Men/Vampire/HP every time
- Who goes first was split pretty evenly between the two
- Glare only happened one time
- Things I was wrong about:
 - Charm happened less than 50% of the time, though not far below
 - Barbarian beat Medusa once