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Project 3 Document (Design + Reflection)

April 29, 2018

Character Class

* **Data Members**
  + int strengthPoints;
  + int armor;
  + int defenseMin;
  + int defenseMax;
  + int attackMin;
  + int attackMax;
* **Functions**
  + Character();
    - Default constructor, just returns 0 since no actual characters will be created
  + virtual std::string getType();
    - accessor function that returns string for character, pure virtual function to be overridden by each character
  + int getStrengthPoints();
    - accessor function for strength points
  + void setStrengthPoints(int strengthPointsIn);
    - mutator function for strength points
  + int getArmor();
    - accessor function for armor
  + virtual int attack();
    - generates random number based on dice for character and returns the attack
    - overridden by charcters with special attack abilities
  + virtual int defense(int attack);
    - takes the damage attacked as a paramater, and calculate the actual damage inflicted, and apply that damage to the defender’s strength points
    - overridden by characters with special defense functions

Barbarian Class:

* **Data Members**
  + Inherits from character
* **Functions**
  + default constructor that sets the data member values for barbarian
  + overridden getType function that return BARBARIAN
  + no special abilities so attack and defense functions are inherited from character

BlueMen Class

* **Data Members**
  + Inherits from character
* **Functions**
  + default constructor that sets the data member values for blue men
  + mob function that decreases the die roll for defense based on strength points
  + overridden getType function that return BLUEMEN
  + overridden defense fucniton that uses mob to check the dice before spinning for defense
  + no special attack ability so inherits from character

HarryPotter Class:

* **Data Members**
  + Inherits from charcter
  + Bool resurrected that is false until harry potter has come back to life
* **Functions**
  + default constructor that sets the data member values for harry potter
  + Hogwarts function checks if resurrected is false and strength points are less than 0 and resurrects harry
  + overridden getType function that return HARRYPOTTER
  + overridden defense fucniton that uses Hogwarts function to resurrected harry the first time he dies
  + no special attack ability so inherits from character

Medusa Class:

* **Data Members:**
  + Inherits from character
* **Functions**
  + default constructor that sets the data member values for medusa
  + overridden getType function that return MEDUSA
  + overridden attack function that activates glare if a12 is spun, sets attack roll to -1, so this can be checked from other players defense functions
  + no special abilites for defense do inherits from character

Vampire Class:

* **Data Members:**
  + Inherits from character
* **Functions**
  + default constructor that sets the data member values for vampire
  + charm function which generates a number between 1 and 2, if 1 is spun, vampire will not be attacked, otherwise is regular
  + overridden getType function that return VAMPIRE
  + overrideen defense function that calls charm tocheck if campire will be attacked before calculating damage
  + no special abilites for attack do inherits from character

Game Class

* **Data Members**
  + Menu Object
* **Functions**
  + Choose character
    - Calls menu function choose character
    - Switch statement based on char chosen
    - Allocates memory for character
  + Round
    - Loops while both chars have strength
    - Displays attack information
    - Calls attack for p1
    - Calls defense for p2
    - If p2 has strength
    - Displaysattack information
    - Calls attack for p2
    - Calls defense for p1
    - Deletes memory

Menu Class:

* + **Functions**
    - Continue playing functionasks if the suer would like to continue playing and validates input
    - Choose charcter asks the user what kind of character it would like to use and validates input

Source File:

* + seed random
  + declare game, menu, p1, p2
  + loop while choosechar=1
  + call choose char for p1 and set char
  + call choose char for p2 and set char
  + call round function with p1 and p2

Test Plan:

**Player 1 Choose Your Character**

Noninteger- reprompt

Under 1 or above 5-reprompt

1-5->select that character and move on to p2

**Player 2 Choose Your Character**

Noninteger- reprompt

Under 1 or above 5-reprompt

1-5->select that character and move on to game play

**1. Play Again.**

**2. Exit the game.**

Nonint-reprompt

Not 1 0r 2 -repromot

1-ask for choose char again

2-exit game

**Test Case 1: Vampire vs Barbarian**

Player One: Vampire ATTACKS Player Two: Barbarian

Defender has 12 strength points and 0 armor.

Attacker has spun a 10 and Defender has spun a 12

Defender has sustained 0 damage and currently has 12 strength points

Player Two: Barbarian ATTACKS Player One: Vampire

Defender has 18 strength points and 3 armor.

Vampire has used charm and cannot be attacked.

Defender has sustained 0 damage and currently has 18 strength points

Player One: Vampire ATTACKS Player Two: Barbarian

Defender has 12 strength points and 0 armor.

Attacker has spun a 7 and Defender has spun a 6

Defender has sustained 1 damage and currently has 11 strength points

Player Two: Barbarian ATTACKS Player One: Vampire

Defender has 18 strength points and 3 armor.

Vampire has used charm and cannot be attacked.

Defender has sustained 0 damage and currently has 18 strength points

Player One: Vampire ATTACKS Player Two: Barbarian

Defender has 11 strength points and 0 armor.

Attacker has spun a 12 and Defender has spun a 10

Defender has sustained 2 damage and currently has 9 strength points

Player Two: Barbarian ATTACKS Player One: Vampire

Defender has 18 strength points and 3 armor.

Attacker has spun a 4 and Defender has spun a 6

Defender has sustained 0 damage and currently has 18 strength points

Player One: Vampire ATTACKS Player Two: Barbarian

Defender has 9 strength points and 0 armor.

Attacker has spun a 6 and Defender has spun a 9

Defender has sustained 0 damage and currently has 9 strength points

Player Two: Barbarian ATTACKS Player One: Vampire

Defender has 18 strength points and 3 armor.

Vampire has used charm and cannot be attacked.

Defender has sustained 0 damage and currently has 18 strength points

Player One: Vampire ATTACKS Player Two: Barbarian

Defender has 9 strength points and 0 armor.

Attacker has spun a 9 and Defender has spun a 2

Defender has sustained 7 damage and currently has 2 strength points

Player Two: Barbarian ATTACKS Player One: Vampire

Defender has 18 strength points and 3 armor.

Vampire has used charm and cannot be attacked.

Defender has sustained 0 damage and currently has 18 strength points

Player One: Vampire ATTACKS Player Two: Barbarian

Defender has 2 strength points and 0 armor.

Attacker has spun a 10 and Defender has spun a 7

Defender has sustained 3 damage and currently has -1 strength points

PLAYER TWO LOSES!

**Test Case 2: Harry Potter vs Medusa**

Player One: Harry Potter ATTACKS Player Two: Medusa

Defender has 8 strength points and 3 armor.

Attacker has spun a 10 and Defender has spun a 6

Defender has sustained 1 damage and currently has 7 strength points

Player Two: Medusa ATTACKS Player One: Harry Potter

Defender has 10 strength points and 0 armor.

Attacker has spun a 2 and Defender has spun a 11

Defender has sustained 0 damage and currently has 10 strength points

Player One: Harry Potter ATTACKS Player Two: Medusa

Defender has 7 strength points and 3 armor.

Attacker has spun a 12 and Defender has spun a 5

Defender has sustained 4 damage and currently has 3 strength points

Player Two: Medusa ATTACKS Player One: Harry Potter

Defender has 10 strength points and 0 armor.

Attacker has spun a 2 and Defender has spun a 12

Defender has sustained 0 damage and currently has 10 strength points

Player One: Harry Potter ATTACKS Player Two: Medusa

Defender has 3 strength points and 3 armor.

Attacker has spun a 8 and Defender has spun a 2

Defender has sustained 3 damage and currently has 0 strength points

**Test Case 3: Blue Men vs Blue Men**

Player One: Blue Men ATTACKS Player Two: Blue Men

Defender has 12 strength points and 3 armor.

Attacker has spun a 19 and Defender has spun a 10

Defender has sustained 6 damage and currently has 6 strength points

Player Two: Blue Men ATTACKS Player One: Blue Men

Defender has 12 strength points and 3 armor.

Attacker has spun a 9 and Defender has spun a 17

Defender has sustained 0 damage and currently has 12 strength points

Player One: Blue Men ATTACKS Player Two: Blue Men

Defender has 6 strength points and 3 armor.

Attacker has spun a 9 and Defender has spun a 2

Defender has sustained 4 damage and currently has 2 strength points

Player Two: Blue Men ATTACKS Player One: Blue Men

Defender has 12 strength points and 3 armor.

Attacker has spun a 5 and Defender has spun a 10

Defender has sustained 0 damage and currently has 12 strength points

Player One: Blue Men ATTACKS Player Two: Blue Men

Defender has 2 strength points and 3 armor.

Attacker has spun a 11 and Defender has spun a 6

Defender has sustained 2 damage and currently has 0 strength points

**Test Case 4: Blue Men vs Harry Potter**

Player One: Harry Potter ATTACKS Player Two: Blue Men

Defender has 12 strength points and 3 armor.

Attacker has spun a 4 and Defender has spun a 18

Defender has sustained 0 damage and currently has 12 strength points

Player Two: Blue Men ATTACKS Player One: Harry Potter

Defender has 10 strength points and 0 armor.

Attacker has spun a 14 and Defender has spun a 5

Defender has sustained 9 damage and currently has 1 strength points

Player One: Harry Potter ATTACKS Player Two: Blue Men

Defender has 12 strength points and 3 armor.

Attacker has spun a 12 and Defender has spun a 7

Defender has sustained 2 damage and currently has 10 strength points

Player Two: Blue Men ATTACKS Player One: Harry Potter

Defender has 1 strength points and 0 armor.

Attacker has spun a 15 and Defender has spun a 9

Defender has sustained 6 damage and currently has -5 strength points

Harry Potter comes back to life

Player One: Harry Potter ATTACKS Player Two: Blue Men

Defender has 10 strength points and 3 armor.

Attacker has spun a 2 and Defender has spun a 17

Defender has sustained 0 damage and currently has 10 strength points

Player Two: Blue Men ATTACKS Player One: Harry Potter

Defender has 10 strength points and 0 armor.

Attacker has spun a 19 and Defender has spun a 6

Defender has sustained 13 damage and currently has -3 strength points

Harry Potter has already been resurrected once.

PLAYER ONE LOSES!

**Test Case 5:Medusa vs Barbarian**

Player One: Medusa ATTACKS Player Two: Barbarian

Defender has 12 strength points and 0 armor.

Attacker has spun a 3 and Defender has spun a 8

Defender has sustained 0 damage and currently has 12 strength points

Player Two: Barbarian ATTACKS Player One: Medusa

Defender has 8 strength points and 3 armor.

Attacker has spun a 5 and Defender has spun a 5

Defender has sustained 0 damage and currently has 8 strength points

Player One: Medusa ATTACKS Player Two: Barbarian

Defender has 12 strength points and 0 armor.

Attacker has spun a 4 and Defender has spun a 3

Defender has sustained 1 damage and currently has 11 strength points

Player Two: Barbarian ATTACKS Player One: Medusa

Defender has 8 strength points and 3 armor.

Attacker has spun a 2 and Defender has spun a 4

Defender has sustained 0 damage and currently has 8 strength points

Player One: Medusa ATTACKS Player Two: Barbarian

Defender has 11 strength points and 0 armor.

Attacker has spun a 10 and Defender has spun a 2

Defender has sustained 8 damage and currently has 3 strength points

Player Two: Barbarian ATTACKS Player One: Medusa

Defender has 8 strength points and 3 armor.

Attacker has spun a 3 and Defender has spun a 2

Defender has sustained 0 damage and currently has 8 strength points

Player One: Medusa ATTACKS Player Two: Barbarian

Defender has 3 strength points and 0 armor.

Attacker has spun a 2 and Defender has spun a 10

Defender has sustained 0 damage and currently has 3 strength points

Player Two: Barbarian ATTACKS Player One: Medusa

Defender has 8 strength points and 3 armor.

Attacker has spun a 4 and Defender has spun a 1

Defender has sustained 0 damage and currently has 8 strength points

Player One: Medusa ATTACKS Player Two: Barbarian

Defender has 3 strength points and 0 armor.

Attacker has spun a 9 and Defender has spun a 10

Defender has sustained 0 damage and currently has 3 strength points

Player Two: Barbarian ATTACKS Player One: Medusa

Defender has 8 strength points and 3 armor.

Attacker has spun a 11 and Defender has spun a 2

Defender has sustained 6 damage and currently has 2 strength points

Player One: Medusa ATTACKS Player Two: Barbarian

Defender has 3 strength points and 0 armor.

Attacker has spun a 5 and Defender has spun a 10

Defender has sustained 0 damage and currently has 3 strength points

Player Two: Barbarian ATTACKS Player One: Medusa

Defender has 2 strength points and 3 armor.

Attacker has spun a 4 and Defender has spun a 4

Defender has sustained 0 damage and currently has 2 strength points

Player One: Medusa ATTACKS Player Two: Barbarian

Defender has 3 strength points and 0 armor.

Attacker has spun a 3 and Defender has spun a 7

Defender has sustained 0 damage and currently has 3 strength points

Player Two: Barbarian ATTACKS Player One: Medusa

Defender has 2 strength points and 3 armor.

Attacker has spun a 8 and Defender has spun a 5

Defender has sustained 0 damage and currently has 2 strength points

Player One: Medusa ATTACKS Player Two: Barbarian

Defender has 3 strength points and 0 armor.

Attacker has spun a 7 and Defender has spun a 6

Defender has sustained 1 damage and currently has 2 strength points

Player Two: Barbarian ATTACKS Player One: Medusa

Defender has 2 strength points and 3 armor.

Attacker has spun a 3 and Defender has spun a 3

Defender has sustained 0 damage and currently has 2 strength points

Player One: Medusa ATTACKS Player Two: Barbarian

Defender has 2 strength points and 0 armor.

Glare has been used

Defender has sustained 2 damage and currently has 0 strength points

**Reflection :**

I made a few design changes while working on this project. When I first designed the project, I did not include the getType function.. However, the instructions stated that the classes had to be abstract. I included the overridden getType function to fulfill this requirement, as I did not need to override any of the functions in my original design. Another change I made was in the round function. I added in the if statement to check if p2 was dead before calling the second part of the round. Before I added this in, a full round would run even if p2 was already dead.