Design

Program name : Project3_Design_Description_Schaefer_Kristin.pdf
Author : Kristin Schaefer
Date : 05-12-2019

Main Function

Description: The Main function creates a Game object and calls all of the Game functions necessary to play the Fantasy Combat game.

Process:

1. Create Game object
2. Call menu function to ask user if they want to play Fantasy Combat game.
3. If user selects to play game, ask to select two characters to combat each other.
4. Call game member function to dynamically allocate new player objects.
4. Call Game member function to play the Fantasy Combat game.
5. After player dies, delete memory of player objects and ask user if they want to play the game again.

Character Class

Description: The Character class is the parent class of Barbarian, Vampire, Blue Men, Medusa and Harry Potter. It is an abstract class and does not define any member functions. All of the member functions declared in Character are defined in the derived class Barbarian.

Key data members:

1. int armor
   - Holds the value to subtract from attacker's damage points in addition to player's defense roll points.
2. int strength
   - Holds the player's current strength value. If the player's strength goes below 0 the player dies.
   - Harry Potter gets another life and extra strength points if his strength goes below 0.
3. int roll
   - Keeps track of player's dice roll (attack and defense)
4. string playerName
   - Keeps track of player's name (Vampire, Barbarian, Blue Men, Medusa, Harry Potter)

Key functions:

1. attack()
   - Pure virtual function
   - This function calls the rollDice function and passes the value, aka damage, to the defender's defense function.
2. defense()
   - Pure virtual function
   - This function calls the rollDice function and checks the damage value of the attacker.
   - Calculates the amount of strength to reduce based on the damage points.
3. rollDice()
   - Pure virtual function
   - Takes the number of dice and sides and generates a random dice roll for attack and defense functions.

Barbarian Class

Description: The Barbarian class is a derived class of the Character class. It does not have any special characteristics.

Key data members (not inherited):

1. All characteristics inherited from Character class

Key functions (defined):

1. attack()
   - Overidden and defined
   - Inherited by Vampire, Blue Men and Harry Potter classes
   - Overidden by Medusa class
2. defense()
   - Overidden and defined
   - Inherited by Medusa class
   - Overidden by Vampire, Blue Men and Harry Potter classes

3, rollDice()
   - Overidden and defined

- Inherited by all Character derived classes

Vampire Class

Description: The Barbarian class is a derived class of the Character class. It has the special characteristic of charm, which gives the Vampire a 50% chance of turning an attacker’s damage to 0 points.

Key data members (not inherited):

1. All characteristics inherited from Character class

Key functions (defined or overidden):

2. defense()
    - Overidden
    - Introduces random (1 or 2) to tell if the Vampire uses charm on opponent
    - Overrides Medusa glare characteristic

Blue Men Class

Description: The Blue Men class is a derived class of the Character class. It has the special characteristic of mob, which reduces the number of defense dice each time the Blue Men lose 4 strength points.

Key data members (not inherited):

1. int numDefenseDice
    - Holds the number of defense dice the Blue Men have

Key functions (defined or overidden):

2. defense()
    - Overidden
    - Reduces a dice each time the Blue Men lose 4 strength points.

Medusa Class

Description: The Medusa class is a derived class of the Character class. It has the special characteristic of glare which reduces the opponents strength points to 0, causing Medusa to win.

Key data members (not inherited):

1. All characteristics inherited from Character class

Key functions (defined or overidden):

2. attack()
    - Overidden
    - Changes Medusa’s damage points to 50 (to take all of opponent’s strength points) if Medusa rolls a 12.

Harry Potter Class

Description: The Harry Potter class is a derived class of the Character class. It has the special characteristic of hogwarts which causes Harry Potter’s strength points to be restored to 20 if his strength goes below 0.

Key data members (not inherited):

1. int lives
    - Keeps track of lives to use with hogwarts characteristic

Key functions (defined or overidden):

2. defense()
    - Overidden
    - Changes Harry Potter’s strength points to 20 and reduces lives if Harry’s strength goes to 0 or below.

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Game Class

Description: The Game class allocates two character objects to represent the Fantasy combat players. The Game controls the attack and defense rounds representing the combat game, and also outputs the game round information to the user.

Key data members:

1. Character pointers to character objects
2. int current round
   - Keeps track of the number of rounds played.

Key functions:

2. createPlayers()
   - Initializes character objects based on user character selection .
3. playGame()
   - Calls the attack and defense functions for two attack rounds.
   - Checks if a character has died, if a character has died end the game.
   - Prints the current round information.
4. printRound()
   - Prints the round output.

Menu function

Description: The Menu function asks the user if they want to play the Fantasy combat game, which players they want to combat each other and if they want to play the game again.

Key functions:

2. playGame()
   - Ask the player if they want to play the game
   - If they want to play, start the game
   - If they do not want to play, exit the game
3. selectCharacters()
   - Asks the select two characters to play the game
   - User can select two of the same character type
4. playAgain()
   - Ask the player if they want to play the game again
   - If they want to play again, restart the game
   - If they do not want to play again, exit the game

Class Hierarchy Diagram

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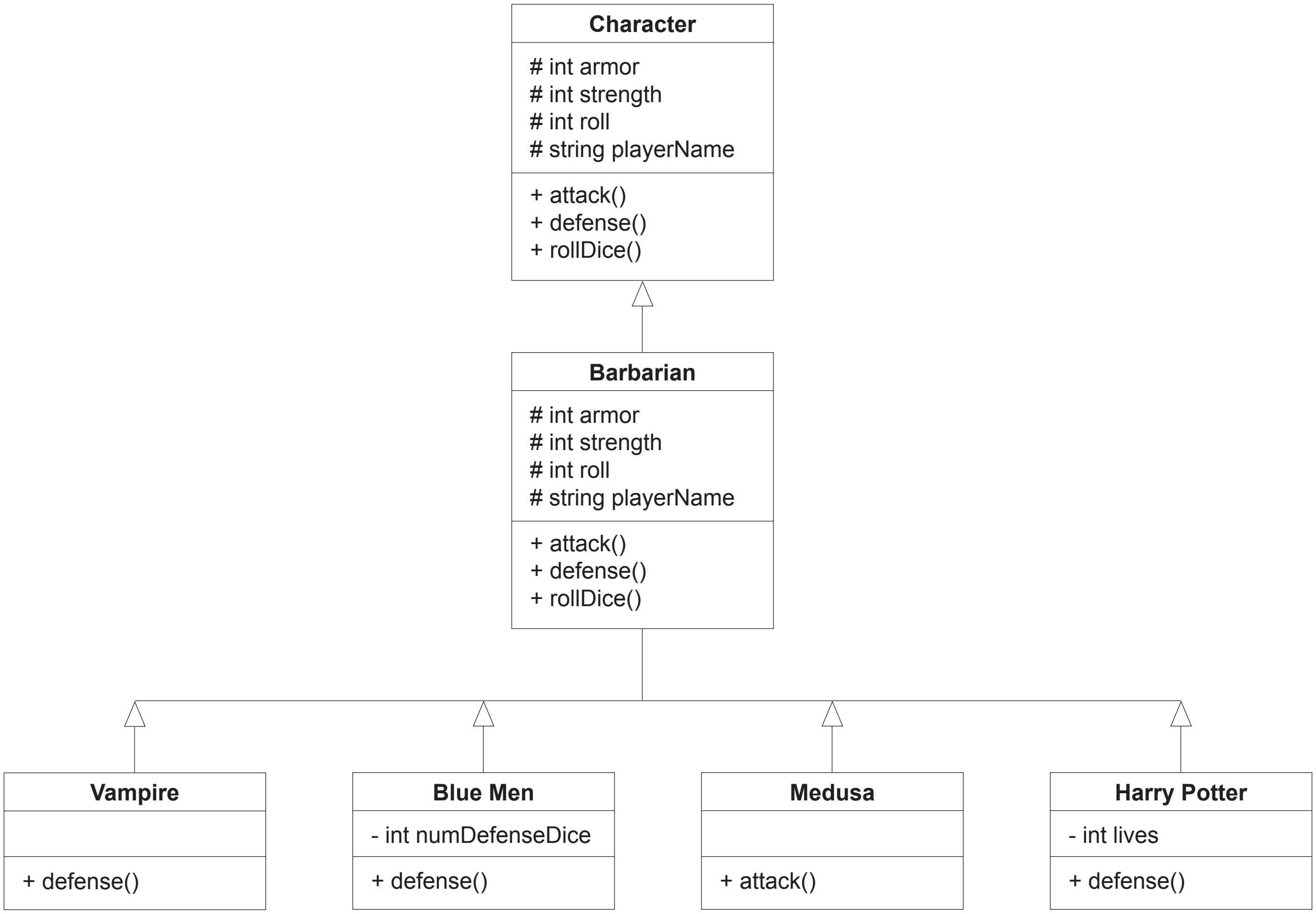
Character
# int armor
# int strength
# int roll
# string playerName
+ attack()
+ defense()
+ rollDice()
Barbarian
# int armor
# int strength
# int roll
# string playerName
+ attack()
+ defense()
+ rollDice()
Vampire
+ defense()
Blue Men
- int numDefenseDice
+ defense()
Medusa
+ attack()
Harry Potter
- int lives
+ defense()