Project 2

Title: The Cave of Zoltan 2.0 (A Dungeons and Dragons 3.5 Battle Simulator)

Course: CIS-5

Section: 47948

Date: December 13th, 2018

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Introduction

       Dungeons and Dragons (D&D or DnD) is a Tabletop Roleplaying Game (RPG) created by Gary Gygax and Dave Arneson. It was inspired by wargames and battle strategy games, expanding on them to be more personalized, focusing on characters and storytelling, and given a Fantasy twist. It was the first Fantasy Roleplaying Game and has inspired many other games since its creation. It is now owned by the company *Wizards of the Coast* and is on its 5th edition, and it also has a Massively Multiplayer Online Roleplaying Game (MMORPG) version called *Dungeons and Dragons Online* (DDO). This program is based on Edition 3.5, a widely popular edition of the game that had many people sticking to it even after they created the 4th and 5th editions, and people even created an expanded version of 3.5 called *Pathfinder.* 3.5 is the edition I am most familiar with.

How the Game Works

Object of the Game

       The goal of this simulation is for the player to knock the enemy's hit points (HPs) to 0 or lower before the enemy can knock them down to 0 or lower, thus knocking them unconscious.

       The full game of D&D does not have one set goal. It is whatever the Dungeon Master (DM, the person running the game and playing the Non-Player Characters, called NPCs, especially the enemies they fight against, but also the allies who help the, and innocents like villagers or prisoners they need to rescue from the enemies, who can sometimes turn into allies), and the players collectively decide. The DM sets up the scenario, often an adventure or a quest, could be a mystery they have to solve, a rescue mission, reconnaissance, retrieving an object, or even just exploration. The players make choices based on what the DM tells them, and sometimes based on what their dice roll. Because of this, the object of the game can change at any moment, but usually the DM and the players have an idea of what they are supposed to achieve and try to stick to it.

       This program simulates a typical one-on-one melee battle, which is usually just a small part of the overall game (though it can happen a lot). Most of the time battles will be more than one-on-one, as it is common for the Player Characters (PCs) to be in a "party" or group, working together to achieve their goal, and the enemies, played by the DM, are often but not always found in groups as well. This just means it will be like this program, but with more people doing it at the same time. That is primarily the importance of initiative. In this program, initiative only determines if the player or the enemy goes first since there are only two characters in the battle, but for a larger battle it determines the order of everyone in combat or assisting those in combat.

Rules of the Game

       It would take me far more than is needed for this project to explain all the rules of D&D. D&D has three Core Rule Books (the Player's Handbook, the Dungeon Master's Guide/DM

Guide, and the Monster Manual), and many other books that are optional for expanding on it, but most of that is not necessary for this program, since this is just dealing with a simple one-on-one melee battle.

The important rules for this program are first for the player to choose which kind of character they want. D&D has several Character Classes for players to choose from, but for the purpose of this program, I have narrowed it down to 3. The Paladin (a strength-based character), the Ranger (a dexterity-based character), and the Fighter (a constitution-based character). The Paladin's higher strength gives them a better attack bonus, making it easier for them to hit their enemy. It also gives them a better damage bonus, making them do more damage to their enemy. The Ranger's higher dexterity gives them a better initiative, increasing their chance of attacking their enemy first. It also gives them a better armor class (AC), making it more difficult for their enemy to do any damage to them. They also have the option of taking the Improved Initiative feat, which adds even more to their initiative bonus. The Fighter's higher constitution gives them more HPs, increasing the amount of damage their enemy must do to them in order to defeat them. They also get the Improved Critical feat, increasing their critical threat range, making it more likely for them to get a critical hit. A critical hit means they made a particularly good hit on their enemy, and doubles or sometimes triples the amount of damage that hit caused.

Gameplay

For this program, first the player chooses what kind of character they will play (or load a saved character if they had previously played), the character's HP, AC, attack bonus, damage bonus, initiative bonus and critical threat range and generated based on the choices the player made and saved to a file named by the player. They are also asked to create a password so only they can access this character later. If they chose instead to load a saved character, they are asked for the file name and their password. If the file is there and their password is correct their character is loaded. Their "Character Sheet" is displayed, showing their HP, AC, attack bonus, damage bonus, initiative bonus and critical threat range. The player then chooses what opponent they will go against. A kobold, the "easy" level, an orc, the "medium" level, or a Drow Elf, the "hard" level. Their player and the enemy then both roll a 20-sided die (D20) and their initiative bonus is added to it to determine who will go first. Whoever's is higher goes first. If it is a tie, it's rolled again.

Whoever had the higher initiative then "rolls to hit", rolling a D20, or in the case of this program, a number between 1 and 20 is randomly generated, and their attack bonus is added to it. If the total of their roll plus their attack bonus is greater than or equal to their opponent's AC, they successfully hit. If just the roll without their attack bonus is within their critical threat range (which is either 20 or 19-20 unless they are a Fighter who has the Improved Critical feat), they have a "possible critical" hit. This means they definitely hit their target and have a chance at causing more damage than a typical blow. They roll again, and if that roll plus their attack bonus is greater than or equal to their opponent's AC (just like with a regular hit roll), it is a critical hit and their damage will typically be doubled or sometimes tripled. If they miss (their roll plus their attack bonus was lower than their opponent's AC), it is the other character's turn. If they hit, they roll for damage. For this program, they would roll a D6 for the easy level, a D8 for the medium

level, and a D12 for the enemy or 2D6 for the player for the hard level. Their damage bonus is added to their roll, and if it was a critical hit it is either doubled or tripled, and that total amount is subtracted from their opponent's HP. It is then the other character's turn and this is repeated until one character has 0 HPs or lower left.

This is very similar to a typical melee battle in the tabletop version, but usually the combat is just one small (albeit important) part of the overall gameplay, which also includes the roleplaying part (interactions between characters, which there is a very small amount of in my program at the very beginning), as well as exploring, and skills to go through other types of obstacles or solve problems. There is also often more strategy in the battles in the tabletop version, and there can also be ranged attacks (like bows, crossbows, spears, or sometimes even guns), as well as spells.

References

1. Dr. Lehr's Lectures and Lab
2. Gaddis, Tony. *Starting out with C++: from Control Structures through Objects*. 8th ed., Pearson, 2015.
3. *Dungeons & Dragons*, dnd.wizards.com

Pseudocode

Ask the user if they wish to load a saved character or create a new character.
Get their response.

If they wish to create a new character take them to the Character Creation part:
    Ask them if they want a Strength-based character, a Dexterity-based character, or a
    Constitution-based character.
    Get their response.
        Generate the appropriate random numbers for the HP and AC depending on which
        Character type they chose.
        Ask them to choose a name for their file.
        Ask them to choose a password to access their file.
        Write the generated information to that file.
        Ask them to open their file.
        Display the information in the file.

If they wish to load a saved character:
    Ask them for the file name
    Ask them for their password
    If the password is correct
        Read the information off that file.
    Else, tell them it is an incorrect password
        Let them try again
        If it is correct:
                Read the information off that file.
        Else, tell them it is incorrect and end program.
Display the information from that file.
Save the specified information to the variables.

Display the NPC's interaction
Ask for their name
Get their name
Output their name and display the rest of the NPC's interaction

Display the menu showing the options for the Easy, the Medium and the
Hard versions of the game.
Get their choice
    If they choose either 1, 2 or 3
    Display their opponent's information depending on which version they chose.
    Generate the initiatives to see if the player or the computer goes first.
    If the player goes first, generate their attack roll
        Wait for them to press enter
        Display the random number and their attack bonus and the random
        Number + their attack bonus
        If the random number + the PC's attack bonus >= their opponent's

AC, display "You hit!",
If the random number >= their Critical threat range,
      Display "Possible Critical. Rerolling to see if it's Critical"
      Generate their roll
      Wait for them to press enter
      Display the random number and their attack bonus and the
      Random number + their attack bonus
      If the random number + the PC's attack bonus >=
            Their opponent's AC, display "Critical Hit!",
            Generate their damage roll
            Wait for them to press enter
            Display their damage roll and their damage bonus
            And add that together and multiply it by two
            Display their total damage
            Subtract their total damage from the enemy's HP
      Else display "Not a Critical Hit" and generate their
            Damage normally (see below)
Else generate their damage roll
      Wait for them to press enter
      Display their damage roll and their damage bonus and their total
      Damage
      Subtract their total damage from the enemy's HPs.

Generate the enemy's attack roll
Display the enemy's attack roll and their attack bonus and their
Attack roll + their attack bonus
If the random number + the Enemy's attack bonus >= PC's AC,
      Display "They hit!"
      If the random number >= their Critical threat range,
      Display "Possible Critical. Rerolling to see if it's
      Critical". Generate their roll
      Display the random number and their attack bonus
      And the Random number + their attack bonus
      If the random number + their attack bonus >= the PC's AC,
            display "Critical Hit!",
            Generate their damage roll
            Display their damage roll and their damage
            Bonus and add that together and multiply it By two
            Display their total damage
            Subtract their total damage from the PC's damaged HP
      Else display "Not a Critical Hit" and generate their damage
      normally (see below)

      Generate their damage roll.
      Display their damage roll and their damage bonus and their
      Total damage

Subtract their total damage from the PC's Damaged HPs.
If the enemy's attack roll + their attack bonus is < PC's AC,
    Display "They missed!"
    If the player's random number < their opponent's AC,
        Display "You missed!"
        Generate the enemy's attack roll
        Display the enemy's attack roll and their attack
        bonus and their attack roll + their attack bonus
    If the random number + the Enemy's attack bonus >= PC's
    AC,
        Generate their damage roll.
        Display their damage roll and their damage bonus
        and their total damage
        Subtract their total damage from the PC's Damaged
        HPs.
        If the enemy's attack roll + their attack bonus is <
        PC's
            AC, display "They missed!"
            Loop until the enemy's HP or the PC's
            damaged HP <= 0

If the PC's damaged HP > their opponent's HP display "You are victorious!"
    Reassign the PC's full HPs to their damaged HPs variable
If their opponent's HP > PC's damaged HP display "You have been defeated."
    Reassign the PC's full HPs to their damaged HPs variable
If PC's damaged HP == their opponent's HP display "It's a tie."
    Reassign the PC's full HPs to their damaged HPs variable

Loop back to the menu

    If the enemy's initiative roll + their initiative bonus > the PC's initiative
    Roll + their initiative bonus
        Same as above but the enemy goes first.

    If the enemy's initiative roll + their initiative bonus == the PC's initiative roll + their
    initiative bonus
        Display "It's a tie!"
        Generate the initiatives again until one is higher than the other.

If they choose anything that isn't 1, 2, 3 or 4,
    Tell them to choose one of the options and loop back to the menu

If they choose 4 confirm that they want to quit.
    If they choose to quit, end the program.

Screenshots of Gameplay

Project2_FinalVersion_JasmineSeveri (Build, Run) ✕   **Project2_FinalVersion_JasmineSeveri (Run)** ✕

```
[Welcome to the Dungeons & Dragons 3.5 Battle Simulator!
Type 0 to load a saved character.
Type 1 to create a new character.
Choose: 1

[Character Creation:
 This is where you choose what kind of character you want.

 Paladin: For this game, a Paladin will focus on Strength.
 Having a character who focuses on Strength will give you better attack and damage bonuses,
 making it easier to hit your enemy and increasing the amount of damage you cause them.
 You also get a +2 magic weapon which adds an additional +2 to your attack and damage bonuses.

 Ranger: A Ranger focuses on Dexterity.
 Having a character who focuses on Dexterity will give you a better Armor Class which will make it harder for the enemy to hit you,
 and gives you a better initiative bonus, which makes it more likely for you to go first.
 You also have the option of having the Improved Initiative feat which gives you an additional +4 to your initiative.

 Fighter: For this game, a Fighter will focus on Constitution.
 Having a character who focuses on Constitution gives you more Hit Points.
 You also get the Improved Critical feat which increases your Critical Hit threat range from 19-20 to 17-20.
 Successful Critical Hits double your damage.

 --> Type 1 if you want to play a Paladin.
 --> Type 2 if you want to play a Ranger.
 --> Type 3 if you want to play a Fighter.
 Choose your character: []
```

Project2_FinalVersion_JasmineSeveri (Build, Run) ✕   **Project2_FinalVersion_JasmineSeveri (Run)** ✕

```
--> Type 1 if you want to play a Paladin.
--> Type 2 if you want to play a Ranger.
--> Type 3 if you want to play a Fighter.
Choose your character: 2

Would you like the Improved Initiative feat? Y/N: y

Please enter a one word file name to save your character: Jasmine
Please create a password: 1234
Type a file name to load your character: Jasmine

You have 31 Hit Points
Your Armor Class is 24
Your attack bonus is 7
Your damage bonus is 3
Your initiative bonus is 8
Your Critical Hit threat range is 19-20.]

[Now entering the Cave of Zoltan.]
[Press Enter]

Greetings, Mortal. I am

ZZZZZZ    OOOOO      L       TTTTTTTTT      A               N          N
    Z    O     O     L           T         A A             N N        N
   Z     O     O     L           T        A   A           N  N       N
  Z      O     O     L           T        A   A          N   N     N
 Z       O     O     L           T       AAAAAAAAA       N     N   N
Z        O     O     L           T      A       A      N       N N
ZZZZZZ    OOOOO      LLLLLLL     T      A         A    N          N

Who dares enter my dungeon?
Halt, and state your name.
[Enter your character's name]: []
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```
[Enter your character's name]: Jasmine the Brave


Jasmine the Brave, is it?
Well, you have caught me in a charitable mood, Jasmine the Brave, so I will allow you to choose your executioner.
If you defeat my guard in combat, I may let you go free.

Choose your opponent:
1 -> A Kobold (Easy)
2 -> An Orc (Medium)
3 -> A Drow (Hard)
4 -> I am done (Quit)
[Choose 1 for Easy, 2 for Medium, 3 for Hard, or 4 to Quit]: 1

Enemy's Information:
    HP:        25
    AC:        21
 Attack:       +5
 Damage:       +3
   Init:       +3
   Crit:    20, x 2

[Rolling for Initiative.]
[Press Enter]

[Your initiative roll is: 19 (+8 bonus) = 27]
[Your opponent's initiative roll is: 16 (+3 bonus) = 19]

[You're first!]
3
...
2
...
1
...
```

```
...
Go!
**********
[Your turn!]
[Rolling D20 to hit AC 21 . . .]
[Press Enter]

[You rolled: 2 (+7 bonus) = 9]
[You missed!]

*******
                          [Enemy's turn!]
                          [Rolling D20 to hit AC 24 . . .]
                          [They rolled: 6 (+5 bonus) = 11]
                          [They missed!]

[Press Enter]

**********
[Your turn!]
[Rolling D20 to hit AC 21 . . .]
[Press Enter]

[You rolled: 8 (+7 bonus) = 15]
[You missed!]

*******
                          [Enemy's turn!]
                          [Rolling D20 to hit AC 24 . . .]
                          [They rolled: 12 (+5 bonus) = 17]
                          [They missed!]

[Press Enter]
```

```
[You have 31 Hit Points remaining].

[Press Enter]

*******
                              [Enemy's turn!]
                              [Rolling D20 to hit AC 24 . . .]
                              [They rolled: 11 (+5 bonus) = 16]
                              [They missed!]

[Press Enter]

**********
[Your turn!]
[Rolling D20 to hit AC 21 . . .]
[Press Enter]

[You rolled: 5 (+7 bonus) = 12]
[You missed!]

*******
                              [Enemy's turn!]
                              [Rolling D20 to hit AC 24 . . .]
                              [They rolled: 19 (+5 bonus) = 24]
                              [They hit!]

                              [Rolling D6 for Damage . . .]
                              [They rolled 3. 3 +3 is 6 points of damage.]

[Your opponent has 16 Hit Points remaining].
[You have 25 Hit Points remaining.]

[Press Enter]
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*******
                              [Enemy's turn!]
                              [Rolling D20 to hit AC 24 . . .]
                              [They rolled: 2 (+5 bonus) = 7]
                              [They missed!]

[Press Enter]

**********
[Your turn!]
[Rolling D20 to hit AC 21 . . .]
[Press Enter]

[You rolled: 14 (+7 bonus) = 21]
[You hit!]

[Rolling D6 for Damage . . .]
[Press Enter]

[You rolled 4. 4 (+3 bonus) = 7 points of damage.]

[Your opponent has -6 Hit Points remaining.]
[You have 2 Hit Points remaining].

[Press Enter]

[You are victorious!]

Choose your opponent:
1 -> A Kobold (Easy)
2 -> An Orc (Medium)
3 -> A Drow (Hard)
4 -> I am done (Quit)
[Choose 1 for Easy, 2 for Medium, 3 for Hard, or 4 to Quit]:
```

```
Choose your opponent:
1 -> A Kobold (Easy)
2 -> An Orc (Medium)
3 -> A Drow (Hard)
4 -> I am done (Quit)
[Choose 1 for Easy, 2 for Medium, 3 for Hard, or 4 to Quit]: 5


You must choose your opponent now, puny mortal, or have you changed your mind?

Choose your opponent:
1 -> A Kobold (Easy)
2 -> An Orc (Medium)
3 -> A Drow (Hard)
4 -> I am done (Quit)
[Choose 1 for Easy, 2 for Medium, 3 for Hard, or 4 to Quit]: □

Choose your opponent:
1 -> A Kobold (Easy)
2 -> An Orc (Medium)
3 -> A Drow (Hard)
4 -> I am done (Quit)
[Choose 1 for Easy, 2 for Medium, 3 for Hard, or 4 to Quit]: 4


Leaving so soon?
[Are you sure you wish to quit?
Y for Yes
N for No]: y


3
2
1


I will spare your life for now. Next time, you may not be so lucky.
[You played 23 rounds total.]
[Jasmine the Brave has left the dungeon.]
[Game Over]
RUN SUCCESSFUL (total time: 4m 45s)
□
```

Project2_FinalVersion_JasmineSeveri (Build, Run) ✕   **Project2_FinalVersion_JasmineSeveri (Run)** ✕

```
[Welcome to the Dungeons & Dragons 3.5 Battle Simulator!
Type 0 to load a saved character.
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Choose: 0

Type a file name to load your character: Jasmine
Please enter your password: 1234
You have 31 Hit Points
Your Armor Class is 24
Your attack bonus is 7
Your damage bonus is 3
Your initiative bonus is 8
Your Critical Hit threat range is 19-20.]

[Now entering the Cave of Zoltan.]
[Press Enter]

Greetings, Mortal. I am

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   Z     O    O    L         T       A A        N N      N
  Z      O    O    L         T      A   A       N N      N
 Z       O    O    L         T      A   A      N   N     N
Z        O    O    L         T     AAAAAAAAA    N   N   N
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Project2_FinalVersion_JasmineSev...