Project 1

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

Course: CIS-5

Section: 47948

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Introduction

Dungeons and Dragons is a Tabletop Roleplaying Game, but its battles are essentially dice games. This project is a simulation of a one-on-one melee battle in *Dungeons and Dragons*, specifically based on Edition 3.5. Usually in *Dungeons and Dragons*, the Player Character's. Usually Character Creation is a very important part of Dungeons and Dragons and can take some time to do, especially for new players. For this program, the character creation part will be really simplified. Since this is a melee battle simulator, the user will get to choose between a Dexterity-based character (improving their AC and Initiative), a Strength-based character (improving their attack and damage bonuses), or a Constitution-based character (improving their HPs).

Description

This demonstrates the logic and simulates the gameplay of a one-on-one melee battle between two fighter-type characters. It is based on the combat rules of Edition 3.5 of the Tabletop Roleplaying Game *Dungeons and Dragons.*

Notes

This project required a lot of duplicated code to run properly because there are a lot of possibilities, but it still must have one person, either the player or the computer, going after the other. This is decided randomly. The three levels are also similar to each other with small variations to adjust the difficulty levels of the combat, which means there will be duplicated code there, too.

One possible way to expand on this game would be to have the user gain Experience Points with each battle to help them go up in levels, make them more powerful, and unlock more powerful enemies to fight against. Another possible way to expand on it would be to make it a two-player game, where the user can choose if they want to go against the computer or have another player there with them who will fight against them instead.

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.

        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

    Read the information off that file.

    Display the information from that file.

    Save the specified information to the variables.

Ask for their name

Get their name

Output their name and 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)

        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.

Example Input and Output

main() - Navigator | Notifications | Output ×

Project1_V3_JasmineSeveri (Build, Run) × | **Project1_V3_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: 0

Type a file name to load your character: Kara
You have 31 Hit Points
Your Armor Class is 18
Your attack bonus is 9
Your damage bonus is 4
Your initiative bonus is 3
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]: █
```

Project1_V3_JasmineSeveri (Build, Run) × | **Project1_V3_JasmineSeveri (Run)** ×

```
Kara Zor-El, is it?
Well, you have caught me in a charitable mood, Kara Zor-El, 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]: 2

                              [Your opponent has 21 Hit Points
                              Your opponent's Armor Class is 22
                              Your opponent's attack bonus is +7
                              Your opponent's damage is +3
                              Your opponent's initiative bonus is +3
                              Your opponent's Critical Hit threat range is 19-20.]

[Press Enter to roll for initiative]

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

[It's a tie!]
[Rerolling initiative . . .]
[Press Enter]

[Your initiative roll is: 20 (+3 bonus) = 23]
[Your opponent's initiative roll is: 13 (+3 bonus) = 16]

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

Project1_V3_JasmineSeveri (Build, Run) ✕   **Project1_V3_JasmineSeveri (Run)** ✕

```
[You rolled: 15 (+9 bonus) = 24]
[You hit!]

[Rolling D8 for Damage . . .]
[Press Enter]

[You rolled 4. 4 (+4 bonus) = 8 points of damage.]

[Your opponent has 13 Hit Points remaining.]
[You have 31 Hit Points remaining].

[Press Enter]

                         [Enemy's turn!]
                         [Rolling D20 to hit AC 18 . . .]
                         [They rolled: 4 (+7 bonus) = 11]
                         [They missed!]

[Press Enter]
[Your turn!]
[Rolling D20 to hit AC 22 . . .]
[Press Enter]

[You rolled: 17 (+9 bonus) = 26]
[You hit!]

[Rolling D8 for Damage . . .]
[Press Enter]

[You rolled 4. 4 (+4 bonus) = 8 points of damage.]

[Your opponent has 5 Hit Points remaining.]
[You have 31 Hit Points remaining].

[Press Enter]
```

in() - Navigator   Notifications | Output ✕

Project1_V3_JasmineSeveri (Build, Run) ✕   **Project1_V3_JasmineSeveri (Run)** ✕

```
[Press Enter]

[You rolled: 6 (+9 bonus) = 15]
[You missed!]

                         [Enemy's turn!]
                         [Rolling D20 to hit AC 18 . . .]
                         [They rolled: 9 (+7 bonus) = 16]
                         [They missed!]

[Press Enter]

[Your turn!]
[Rolling D20 to hit AC 22 . . .]
[Press Enter]

[You rolled: 17 (+9 bonus) = 26]
[You hit!]

[Rolling D8 for Damage . . .]
[Press Enter]

[You rolled 2. 2 (+4 bonus) = 6 points of damage.]

[Your opponent has -1 Hit Points remaining.]
[You have 31 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]: █
```

nain() - Navigator | Notifications | Output ✕

Project1_V3_JasmineSeveri (Build, Run) ✕ | Project1_V3_JasmineSeveri (Run) ✕

```
[Press Enter]

[Your turn!]
[Rolling D20 to hit AC 22 . . .]
[Press Enter]

[You rolled: 17 (+9 bonus) = 26]
[You hit!]

[Rolling D8 for Damage . . .]
[Press Enter]

[You rolled 2. 2 (+4 bonus) = 6 points of damage.]

[Your opponent has -1 Hit Points remaining.]
[You have 31 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]: 4

Leaving so soon?
[Are you sure you wish to quit?
0 for No
1 for Yes]: 1

I will spare your life. Next time, you may not be so lucky.
[Game Over]
RUN SUCCESSFUL (total time: 3m 49s)
```

Project1_V3_JasmineSeveri (Build, Run) ✕ | **Project1_V3_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 a Ranger.
--> Type 3 if you want 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: Kendra
Type a file name to load your character: Kendra
You have 24 Hit Points
Your Armor Class is 26
Your attack bonus is 7
Your damage bonus is 3
Your initiative bonus is 8
Your Critical Hit threat range is 19 -20.]
```

Project1_V3_JasmineS

```
main() - Navigator    Notifications    Output ×

  Project1_V3_JasmineSeveri (Build, Run) ×    Project1_V3_JasmineSeveri (Run) ×

                              [They missed!]

[Press Enter]

[Your turn!]
[Rolling D20 to hit AC 26 . . .]
[Press Enter]

[You rolled: 16 (+7 bonus) = 23]
[You missed!]

                              [Enemy's turn!]
                              [Rolling D20 to hit AC 26 . . .]
                              [They rolled: 18 (+8 bonus) = 25]
                              [They hit!]

                              [Possible Critical!]
                              [Rerolling D20 to see if it's Critical . . .]
                              [They rolled: 18 (+8 bonus) = 26]
                              [Critical Hit!]
                              [Rolling D12 for Damage . . .]
                              [They rolled 9. 9 (+4 bonus) x2 = 26 points of damage.]

[Your opponent has 22 Hit Points remaining.]
[You have -22 Hit Points remaining].

[Press Enter]

[You have been defeated.]

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]:
```

Cross Reference for Project 1

You are to fill-in with where located in code

Chapter	Section	Topic	Where Line #"s	Pts	Notes
2	2	cout	65 (and more)		
	3	libraries	9-15	8	iostream, iomanip, cmath, cstdlib, fstream, string, ctime
	4	variables/literals	30-61		No variables in global area, failed project!
	5	Identifiers	30-61		
	6	Integers	37-42	3	
	7	Characters	43-45	3	
	8	Strings	30, 53, 55, 57-59	3	
	9	Floats No Doubles	58	3	Using doubles will fail the project, floats OK!
	10	Bools	49-50	4	
	11	Sizeof *****			
	12	Variables 7 characters or less	Yes		All variables <= 7 characters
	13	Scope ***** No Global Variables			
	14	Arithmetic operators	277 (and a lot more)		
	15	Comments 20%+	1-6 (and a lot more)	5	Model as pseudo code
	16	Named Constants	32-36		All Local, only Conversions/Physics/Math in Global area
	17	Programming Style ***** Emulate	Yes		Emulate style in book/in class repositiory
3	1	cin	69 (and more)		
	2	Math Expression	298 (and a lot more)		
	3	Mixing data types ****			
	4	Overflow/Underflow ****			
	5	Type Casting	111	4	
	6	Multiple assignment *****			
	7	Formatting output	65	4	
	8	Strings	236	3	
	9	Math Library	107	4	All libraries included have to be used
	10	Hand tracing ******			
4	1	Relational Operators			
	2	if	289-300	4	Independent if
	4	If-else	337-379	4	
	5	Nesting	329-381 (and more)	4	
	6	If-else-if	586-599	4	
	7	Flags *****			
	8	Logical operators	289 (and a lot more)	4	
	11	Validating user input	2273-2277	4	
	13	Conditional Operator	122	4	
	14	Switch	256-2278	4	
5	1	Increment/Decrement	969	4	
	2	While	311-585	4	
	5	Do-while	244-2279	4	
	6	For loop	305-308	4	
	11	Files input/output both	100-214	8	
	12	No breaks in loops ******			Failed Project if included
****** Not required to show			Total	100	

Author: Jasmine Severi
Date: 11/5/2018
Purpose: Project 1 flowchart
"The Cave of Zoltan"
Dungeons and Dragons 3.5 battle
simulator game

main

System Libraries

iostream, iomanip,
cstdlib, cmath, ctime,
fstream, string

Standard
Namespace

Declare Variables

PC_Name, PC_HP,
PC_AC, En_HP, En_AC,
PCToHit, Damd, PCDam,
PC_Dam, PC_Dam2,
PC_Init, En_Init, PC_Hit,
En_Hit, En_Dam, lorn,
choose, choice

User Libraries

None

Prompt for input
Load Saved Character (0)
or Create New Character (1)

Global Constants

None

lorn==1

true

Prompt for input
Character 1
Character 2
or Character 3

Function Prototypes

None

false

page 2

lorn==0

true

Prompt for input
Type file name

display information
from file

Prompt for input
State your name

Display menu
get choice

page 2

```
    ( page 2 )                                          ( page 2 )
        |                                                   |
        v                                                   |
    < Choose == 1 > ------> [ Generate and display          |
        |                     character 1      ]----+       |
      false                                         |       |
        |                                           |       |
        v                                           |       v
    < Choose == 2 > ------> [ Generate and display  +--> [ Display menu
        |                     character 2      ]--------->  get choice ]
      false                                           |
        |                                             |
        v                                             |
    < Choose == 3 > ------> [ Generate and display    |
                             character 13     ]-------+
```

```
    < Switch        > ------> [ Generate and
      cases 1, 2, 3 |           display initiative ]
        |                              |
        v                              v
    < Switch >      < While Damd > 0 >---< PC_Init > >--true--> [ Generate PC_Hit ]
      case 4          && En_HP > 0       En_Init                     |
                             false                                   v
                               |                        < PC_Hit >= >--true--> < PC_Hit >= >--true--> [ Generate damage
                               v                          En_AC                  CritTh                 doubled
                          ( page 3 )                       |                       |                    subtract from En_HP ]
                                                         false                   false
                                                           |                       |
                                                           v                       v
                                                  [ Display "You missed!" ]   [ Generate damage
                                                           |                     subtract from
                                                           |                     En_HP ]
                                                           |                       |
                                                           +----------+------------+
                                                                      v
                                                            [ Generate En_Hit ]
                                                                      |
                                                                      v
                                                                 ( page 3 )
```

```
  ( page 3 )
      │
      ▼
  ◇ En_Hit >=        ◇ En_Hit == 19    ──true──▶  ▱ Generate damage
    PC_AC    ───────▶   or 20                        double it
      │                    │                         subtract it from Damd
    false                false
      │                    │
      ▼                    ▼
  ▱ display "They      ▱ Generate damage
     missed"              subtract it from Damd
     loop back                │
                              ▼
                          ◇ Damd <= 0 ll    ◇ if Dam >    ──true──▶  ▱ "You are victorious!"
                            En_HP <= 0  ───▶   En_HP
                                                  │
                                                false
                                                  ▼
                                              ▱ "You have been
                                                 defeated."

  ( page 3 )
      │
      ▼
  ◇ PC_Init <    ──────────────────────▶  ▱ Generate En_Hit
    En_Init                                       │
      │                                           ▼
    false                                    ◇ En_Hit >=    ──true──▶ ◇ En_Hit >=   ──true──▶ ▱ Generate damage
      │                                        PC_AC                    CritTh                   doubled
      ▼                                          │                        │                      subtract from Damd
  ◇ PC_Init ==   ──▶ ▱ Generate initiative     false                    false
    En_Init            again                      │                        │
                                                  ▼                        ▼
                                          ▱ Display "They missed!"   ▱ Generate damage
                                                  │                      subtract from
                                                  │                      Damd
                                                  ▼                        │
                                              ▱ Generate PC_Hit ◀──────────┘
                                                  │
  ( page 3 )                                      ▼
      │                                      ◇ PC_Hit >=   ──true──▶ ◇ PC_Hit >=  ──true──▶ ▱ Generate damage
      ▼                                        En_AC                    CritTh                 double it
  ◇ switch     ──▶ ▱ Prompt for input           │                        │                     subtract it from En_HP
    case 4          "Are you sure you          false                    false
                    want to quit?               │                        │
                    Y/N"                         ▼                        ▼
                      │                     ▱ display "You missed"   ▱ Generate damage
                      ▼                        loop back                subtract it from En_HP
                  ◇ Conf == 1 ──────────▶ ◯ return 0
                      │
                      ▼
                  ▱ loop back
                     to menu
```