CPSC 462 Project

Software Requirement Specifications

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Submitted to:
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I. Introduction

1.1 Purpose

The purpose of this document is to provide the reader with an overview of our CPSC 462 Project. Within this document the reader will find a general overview of our project, hardware and software requirements, the scope of the project as well as the goals and objectives we had going into this project.

1.2 Scope of the Problem

As avid fans of video games, we desired to create a top down 2D dungeon crawler with a mix of both combat and puzzle solving to satisfy fans of old fashioned dungeon crawler/RPGs. We also wanted to use this project as a means to learn the Unity language as this was many of our first times using the Unity engine. This project would both fill the niche of learning and designing a game we could enjoy as well as exploring a new coding language.

1.3 Intended Audience

The primary audience for our project is avid fans of retro video games, especially those who are interested in RPGs and dungeon crawlers. As for the target audience of the SRS, this document is primarily intended for our Professor Lidia Morrison as well as members of our group to confirm the software requirements of our project.

II. Overall Description

2.1 Product Functions

The main purpose of our project is to provide entertainment for RPG and retro video game fans by providing an exciting mix of the two. The game features several levels as well as a sense of progression the player can gain through killing monsters or unlocking chests to acquire stronger weapons. The main features of the game are as follows:

- Character Customization to allow the player to play the character they want to play
- A mixture of combat and puzzle solving through implementation of a combat system as well as the ability to move objects in levels
- A shop system to provide the player with various upgrades to give them a sense of progression.

2.2 Operating Environment

Our project was created primarily in the unity engine and as such, primarily uses C#. Ideally we would release our game as an executable through the usage of a 3rd party application such as Ichio to make it web accessible. This way the user would simply have to click on a desktop shortcut or click on a link to access the game. The game itself can run on any desktop OS.

2.3 Similar System Information

There are thousands of games which implement similar mechanics and concepts that will be used in our games and we have taken inspiration from several of them. Notable influences include: Stardew Valley, Hades, and Enter the Gungeon.

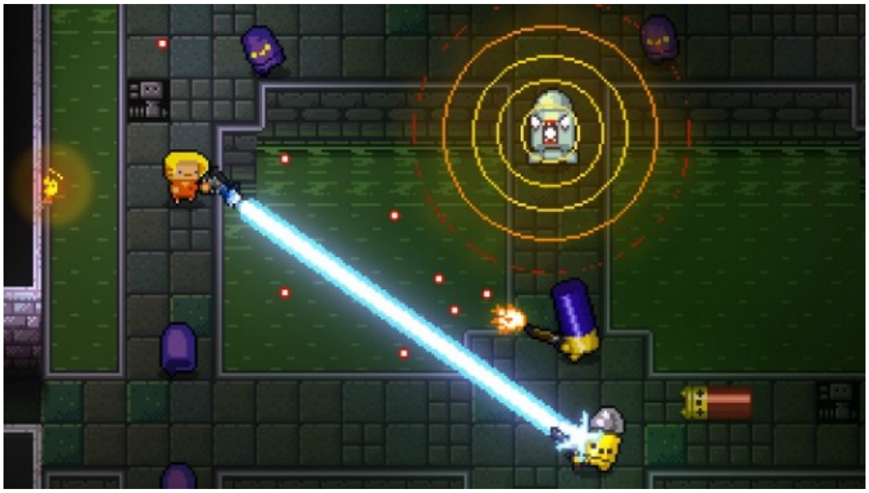
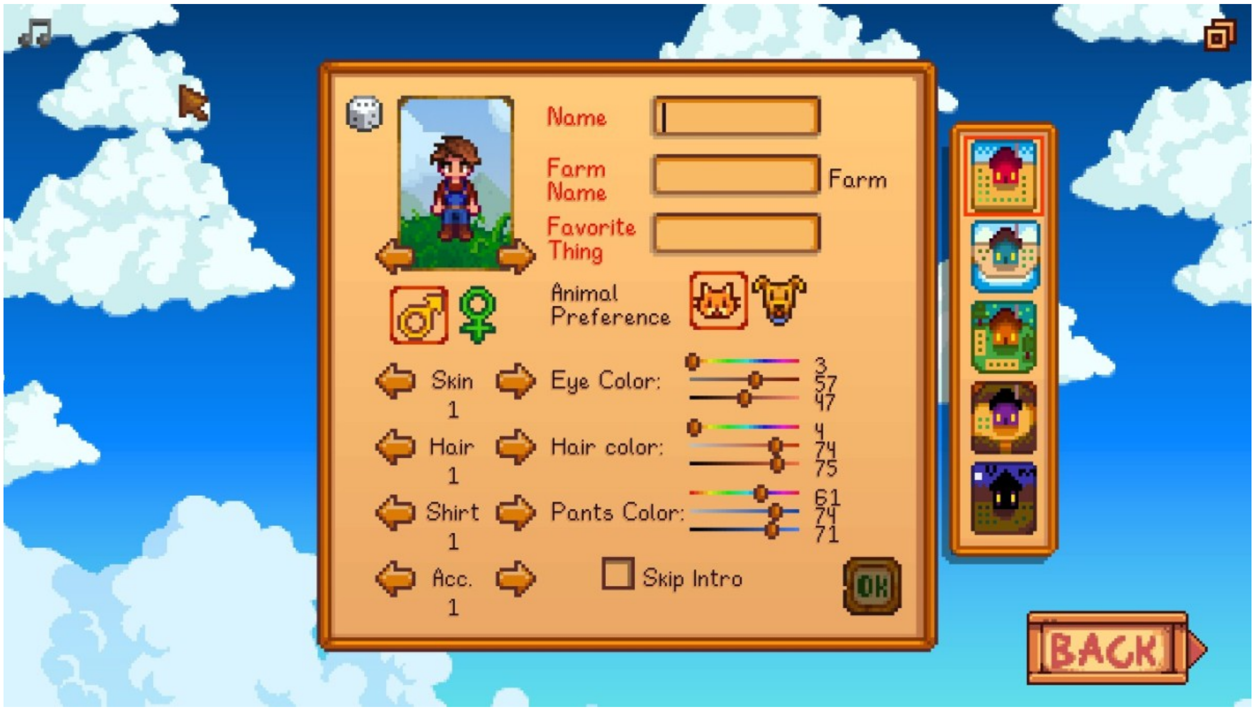


Figure 1: Enter the Gungeon's top-down combat implementation



Name
Farm Name Farm
Favorite Thing
Animal Preference
Skin 1
Hair 1
Shirt 1
Acc. 1
Eye Color: 3 57 47
Hair color: 4 74 75
Pants Color: 61 74 71
□ Skip Intro

Figure 2: Stardew Valley's character selection screen layout

2.4 User Characteristics

Users of our project would primarily be advocates of video games who are looking for a dungeon crawler experience with hints of RPG elements. The app is intended for all age groups and can be enjoyed by players of all skill levels.

2.5 Design and Implementation Constraints

Our project has few constraints aside from the requirements of a PC as currently it is only available on computers. The main constraints our group experienced were time constraints as well as experience constraints. This is our group’s first time using Unity and as such, learning the language slowed down the progression of our project leading to some features we intended to implement in our last iteration being shelved for potential future iterations.

2.6 Assumptions

The SRS assumes the following of the user:

- The user owns a PC.
- The user understands how to use a PC.
- The user has roughly 20 MB of space on their PC.
- The user has basic knowledge of PC games; particularly top down dungeon crawlers.
- The user speaks English.

III. Functional Requirements

3.1 The game shall launch upon clicking the executable

Description

When the executable is clicked, the game will launch

Pre-condition - User has downloaded the required files and executable

Post-condition - The game window is displayed

3.2 The app shall display the title screen

Description

When the application is loaded, the title screen and options for a new game, continue, or exit the game is displayed

Pre-condition - User has executed the game

Post-condition - The title screen and buttons are shown

3.3 The game shall start at the very beginning upon pressing new game

Description

When the new game button is pressed, the character will be able to start at the very beginning of the game with character customization

Pre-condition - User chooses new game

Post-condition - The user is able to customize their characters looks through a set of preset options

3.4 The player shall enter the tutorial stage upon completing character customization

Description

When the player finishes customizing their character’s appearance, the character will load into a tutorial stage explaining basic game mechanics

Pre-condition - User completes their character customization

Post-condition - The player loads into the tutorial stage

3.5 The player shall be able to perform game mechanics upon starting

Description

When loaded into the game, the player will be able to perform basic actions, such as walking, attacking, and using their inventory

Pre-condition - The player enters a game stage

Post-condition - The player freely interacts with the game world

3.6 The player shall progress through the tutorial stage

Description

The player shall perform core gameplay actions to understand the gameplay, such as killing enemies and finding stage portals

Pre-condition - The player loads into the tutorial stage

Post-condition - The player reaches the end stage portal

3.7 The player shall enter the hub-world upon finishing the tutorial stage

Description

The loads into a hub-world where they are able to interact with npcs to upgrade their weapons, learn about the game, or buy potions

Pre-condition - The player loads into the hub-world

Post-condition - The player can freely interact with hub-world objects and npcs

3.8 The shall be able to open and view their inventory by pressing the inventory button

Description

When the player clicks the inventory button, the user will be able to view their collected items and current currency in the inventory UI pop-up.

Pre-condition - The player presses the inventory button

Post-condition - The inventory UI will display along with collected items and currency

3.9 The player shall be able to interact with npcs to open up a shop UI

Description

The player able to press a button to open up different shop UIs unique to the npc

Pre-condition - The player presses the interact button on a npc

Post-condition - The npc's shop UI shall display and be able to interact with

3.10 The player shall be able to upgrade their weapon through a blacksmith npc

Description

The player is able to buy better weapons from the blacksmith npc by clicking on the weapon if they have enough currency.

Pre-condition - The player interacts with the blacksmith npc

Post-condition - The player can select weapons to buy from the blacksmith npc

3.11 The player shall be able to buy potions by interaction with the potion shop npc

Description

The player is able to buy potions to assist them and power them up when interacting with the potion shop npc

Pre-condition - The player interacts with the potion shop npc

Post-condition - The player can select potions to buy from the potion shop npc

3.12 The player shall interact with a portal in the hub-world to progress to new levels

Description

The player is able to progress to new stages by walking into the portal in the hub-world.

Pre-condition - The player walks into the portal

Post-condition - The player loads into a new stage to progress through

3.13 The player shall select which stage to load upon walking into the portal

Description

When the player walks into the portal, a level select screen will appear for the user to choose which level they would like to play.

Pre-condition - The player walks into the portal

Post-condition - The player selects and loads into the stage selected

3.14 The player shall complete a stage upon returning to the hub world through a portal

Description

The player will continue the cycle of progressing through a stage and finding the end portal to reach the hub-world once again as the core gameplay cycle.

Pre-condition - The player walks enters the end stage portal

Post-condition - The player loads back into the hub-world with acquired items and currency from the stage

3.15 The player shall be able to enter a pause screen by pressing escape where they can save, load, and exit the game

Description

The player will continue the cycle of progressing through a stage and finding the end portal to reach the hub-world once again as the core gameplay cycle.

Pre-condition - The opens the pause screen menu by pressing the escape button

Post-condition - The game state saves upon clicking the save button. A save file can be chosen to be loaded upon clicking the load button. The game application will exit upon clicking the exit button.

IV. Quality Attributes

Quality Attribute	**Description**
RT-1	The game should run smoothly on any hardware.
SA-1	The game should be available to play and install as long as the GitHub repository is still up.
AC-1	The game shall be able to be run on any Windows system with the Windows installer and same for macOS.

SA: System Availability

AC: System Accessibility

V. Non-Functional Requirements

- The game should run within 2 seconds of running the program.
- The game should be able to quit smoothly without freezing.

VI. Interface Requirements

There should be a splash screen when the user first opens the game which greets them with three options: New Game, Continue, and Exit. These will function as one would expect. There will be a player customization screen following the previous screen where the user can choose to modify the appearance of their character. Note: this is only for players who choose ‘New Game’.

The main game UI will consist of the player in the map using a simple top down 2D view. There will be no type of damage bar for the user, though there will be a simple inventory screen when the player presses ‘R’ on the keypad. This will display any usable item the user has acquired as well as the player’s currency in coins.

Lastly there will be a required screen for dialogue with NPCs. This will consist of a text box with the text of the NPC the player is currently talking to. This will be prompted to display when the user goes up to an interactable NPC and presses the ‘E’ button.

VII. SWOT Analysis

7.1 Strengths:

While the goals for the project were quite ambitious, there was a distinct separation between what was deemed to be essential and what was not. Because of this, the main essential functionalities of the game were able to come to fruition. Also, because of the nature of the development process, planning and communication, development over a remote position was not a problem within the development process. In fact, it actually made individual work easier since the team was able to work at their own pace and in their own allotted time.

7.2 Weaknesses:

The team, while not ever having used Unity before (some having never used C#), was able to learn relatively quickly. That being said, the lack of previous experience with the software did lead to a slowdown in development at times. It also led to certain functionalities not being added in the final version of the game. An example of this is a Save State feature for the player to continue playing from wherever state they were previously in. Had the team had proper knowledge of the software and language used for the development of the game, many more features would have been added to the game in the final version.

VIII. UML Diagrams

8.1 Use Case Diagrams

From the title screen, the user has several options: New Game, Continue and Options. When the New Game Button is clicked, the user will be sent into the character select screen and from there will begin their journey into the game. Currently, the continue button serves no purpose due to time constraints; however, the goal for the continue button would be to load the player's progress from a previous ‘saved’ playthrough. As such, if the user were to click the continue button, it would load their previous save and send them to the position they left off from. When the Options button is clicked, the user will be sent to the options menu, where they will be able to modify features of the game, including both sound and brightness.

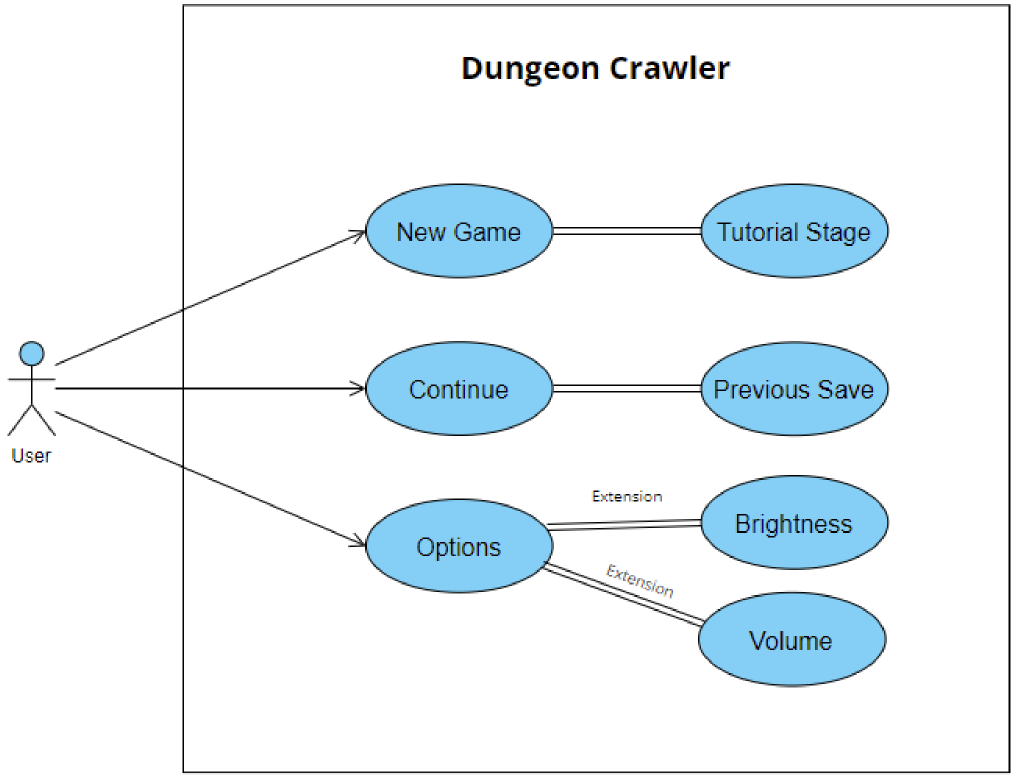


Figure 8.1: Use Case diagram for Dungeon Crawler title screen

8.2 Sequence Diagrams

The sequence diagram below illustrates the path the user will take from opening the game, all the way to entering the Hub World of the game, from which they will be able to access the main features of our game.

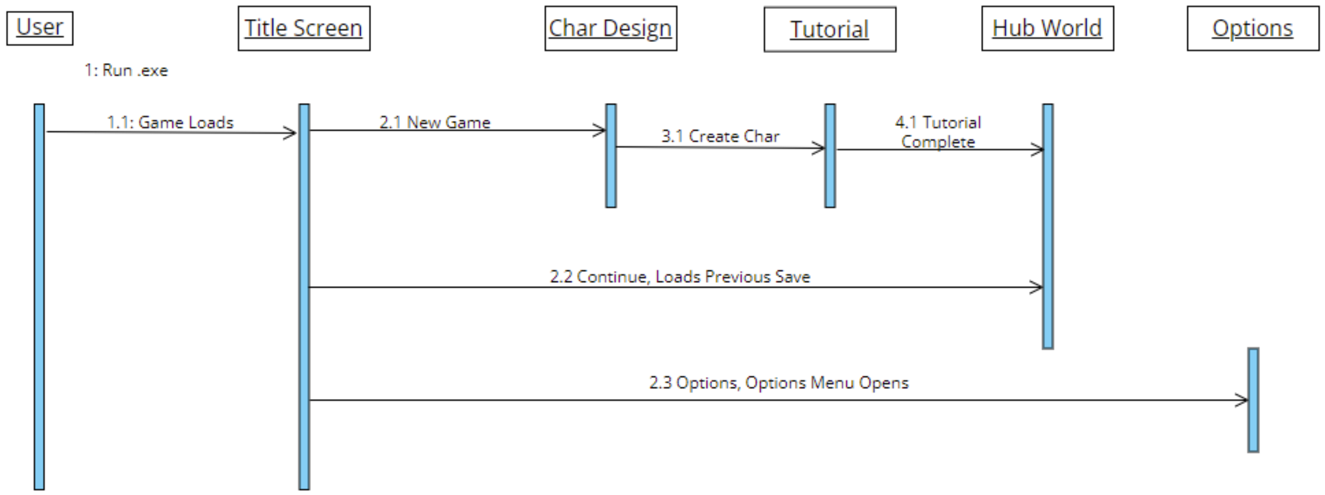


Figure 8.2: Sequence diagram for Dungeon Crawler, from the title screen to the hub world.

VIIII. APPENDIX: User Operations

The Following Section will provide the reader an understanding of how to operate our game.

9.1 Title Screen

From the title screen, the user may simply click the buttons using their left mouse button to access the plethora of options available in front of them. The continue button will have the functionality to load previous save files in future iterations.

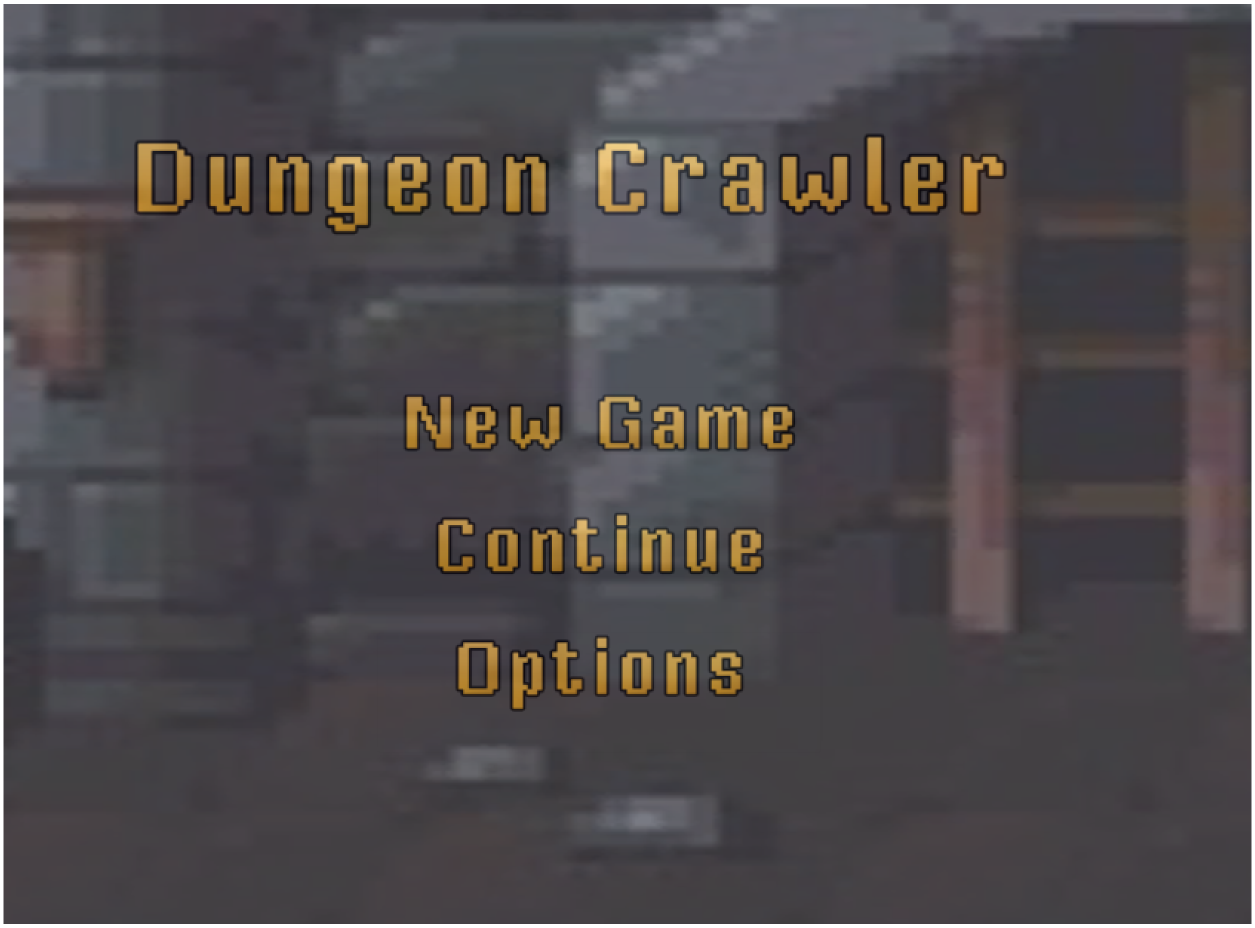


Figure 9.1: The Title Screen of Dungeon Crawler

9.2 Options Menu

From the options menu, the user can adjust these sliders to modify the respective features of said sliders. Modify these features by simply clicking on the sliders and dragging them to the level the user desires.

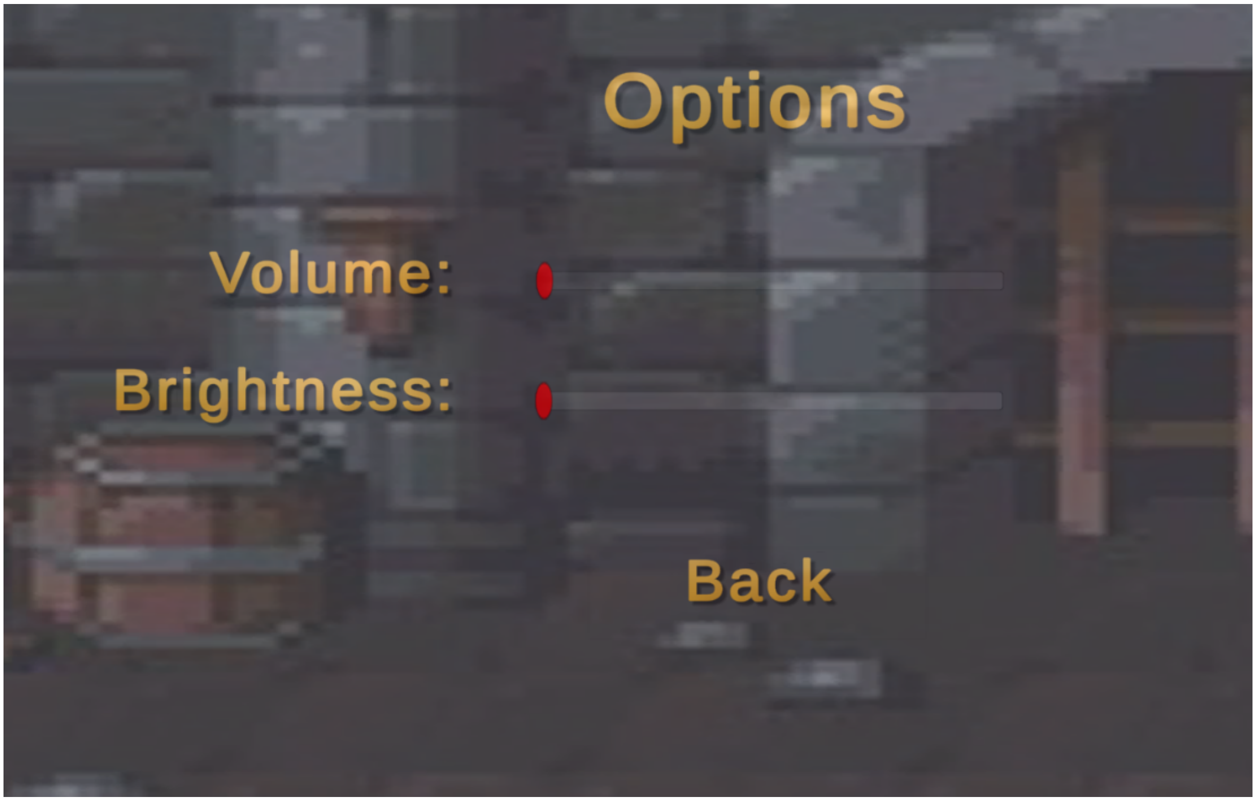


Figure 9.2: Options Menu of Dungeon Crawler

9.3 Character Select Screen

From the character select screen, the user may change the appearance of their character by clicking on the next and previous buttons. When they have found their desired character, they can click on the play button to begin the tutorial level.

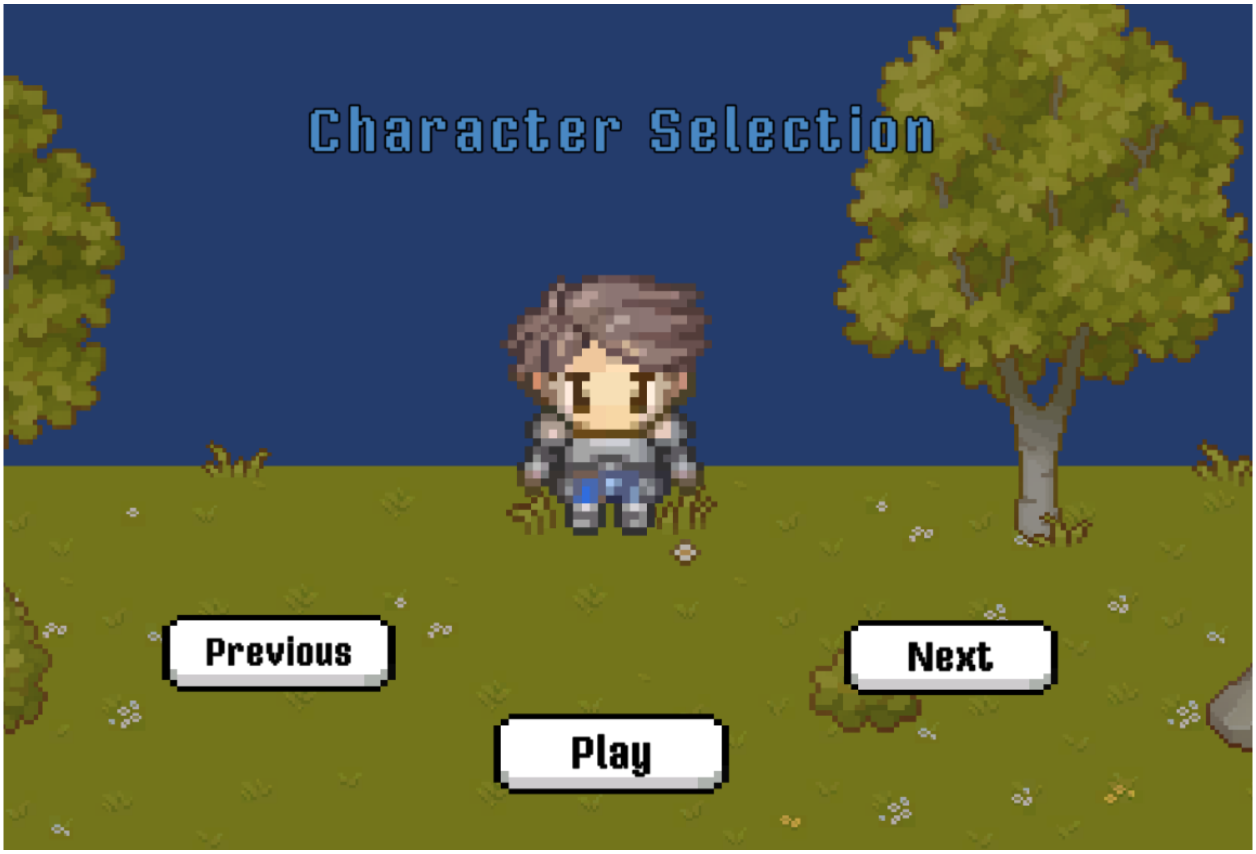
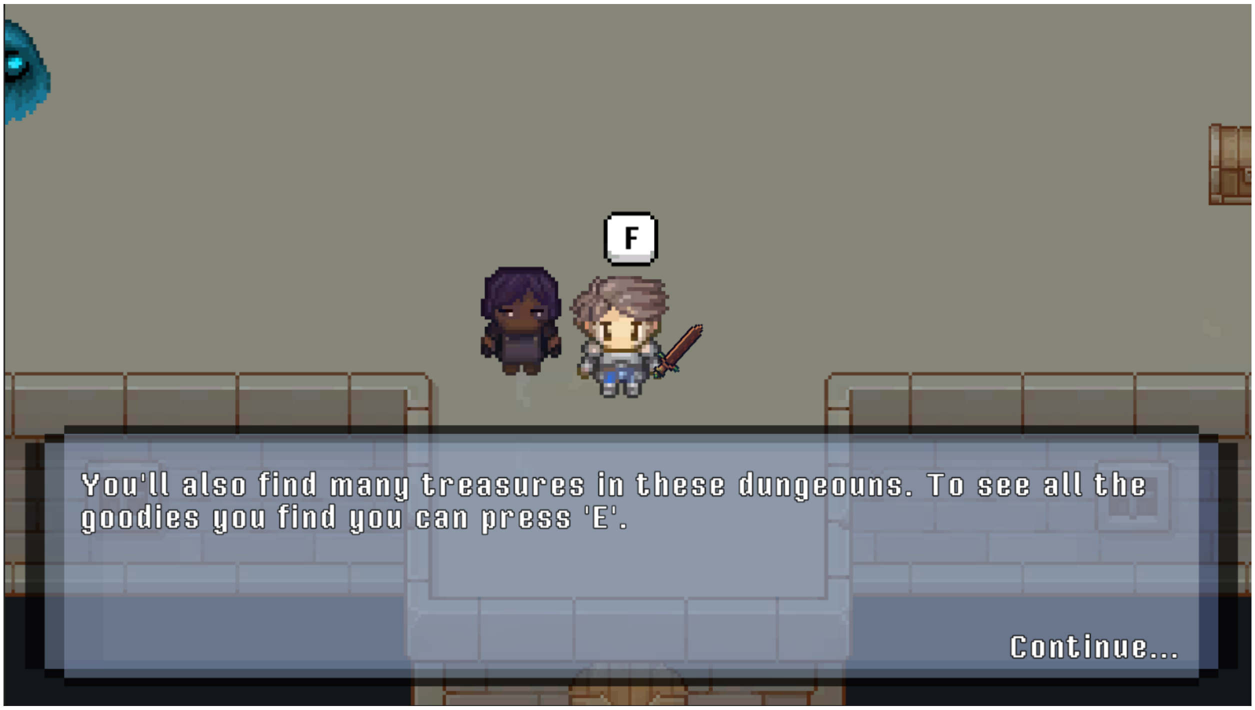


Figure 9.3: Dungeon Crawler Character Select Screen

9.4 Basic Mechanics of the Game

The basic mechanics of the game are as follows: W,A,S,D to move up, left, down, and right respectively. SPACE can be used to attack enemies within melee range. E will be used to open the user’s inventory. F will be used to talk to NPCs.



You'll also find many treasures in these dungeouns. To see all the goodies you find you can press 'E'.

Figure 9.4: The Tutorial Stage of Dungeon Crawler

9.5 Hub World

Within the Hub World, the user will have access to features unique to this zone. The vendors are available here and may be accessed by pressing the F button nearby them. Portals may also be accessed by simply walking within range of them. This will send them to the next zone.

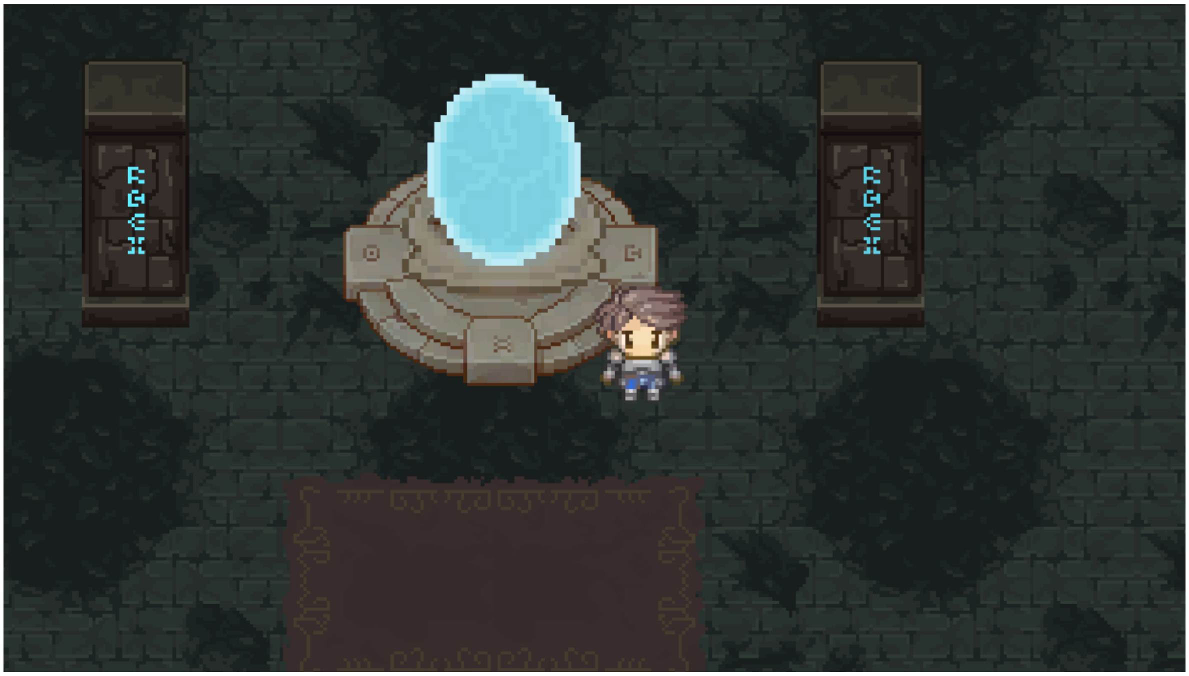


Figure 9.5: The Hub World of Dungeon Crawler

X. Resources Used:

We used a variety of resources to complete our project. The most notable resources included: A variety of free sprite assets available in the Unity Asset Store, most notably The Cainos sprite package, the RF Castle Sprite Package, and the TextMesh Pro mod. As for documentation, Visual Paradigm provided an excellent application for creating easy to understand UML diagrams for the user to read.

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