

**The University of Nevada, Reno
College of Engineering
Department of Computer Science**

Dragonlord Chronicles

Team 18

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Introduction

For our senior project, we will be developing an interactive Role Playing Game where players will be able to explore an immersive, virtual world. This game is designed to allow people to relieve stress and have fun playing with the mechanics that the game will offer.

The theme of the game is a fantasy setting, with technologies from the bronze age, in conjunction with magical forces. The people of the world worship dragons as their divine creators and they believe that dragons are responsible for the magical elements of nature (earth, water, fire, and air).

As the player explores the world, they will talk to NPCs, complete quests, and gain insight to the characters who inhabit the world. The player will explore different biomes in search of the divine dragons to obtain the power needed to seal away a great evil and save the world.

There will be a turn based combat system where the player will have a limited amount of time to decide the turn they will make. They will be able to fight with a weapon, use magic, or use a potion during battle to defeat enemies. There will also be a stats system where each characters stats will have an affect in the outcome of battle.

There will also be an inventory system where the player has to manage their weapons and armor. In addition, when the player explores “cold” and “hot” sections of the world, they may need to change their armor or use a potion that would enable them to traverse the environment.

The game will be controllable with a keyboard and mouse or with an Xbox controller. It will be developed using Unity and written in C#.

The changes in the project between now and the proposal from PA1 is mainly that we have fleshed out the game’s setting, story, and gameplay. These changes were made because we needed a more specific idea for the game’s setting and gameplay. Now that we have a better idea for the direction of our final project, we will be able to create a more refined and fun game.

Summary of Interviews

For the interviews, Eelkee Folmer, Sean Stevens, and Matthew Trenner were asked the following twelve questions:

- 1) Why do you play video games?
- 2) How familiar are you with RPGs?
- 3) What difficulties do you have playing RPGs or video games in general?
- 4) What elements of RPGs do you enjoy, and would like to see in this game?
- 5) What elements of RPGs do you dislike, and would like to see changed or removed for this game?
- 6) Is there anything you wish you could add into an RPG?
- 7) What is your preferred platform to play games on?
- 8) How long do you spend playing games in a typical session?
- 9) How important is realism to you in an RPG?
- 10) How much is cost a factor when determining whether you will decide to play the game?
- 11) How important is the length of a game when deciding to play a game?
- 12) What are the reasons why you decide to stop your gaming session?

Eelkee Folmer was chosen because he is our advisor. In addition, he teaches Fundamentals of Game Design (CS 328) and he is a part of the Digital Interactive Games minor. His responses will provide insight to the important design choices we will make in our game.

When we interviewed him, he made it clear that he does not have a lot of time to play video games. He has a busy schedule between work and family so, despite his passion towards video games, he could go weeks or even months between play sessions. Due to this situation, he prefers short games that can be completed around 10 hours. He simply does not have enough time to sit down and enjoy a 100 hour RPG like Skyrim. Also, his family tends to use the TV so he prefers to play games on mobile consoles and on the Nintendo Switch as it gives him more opportunities for play time.

Sean Stevens was interviewed because he is one of the developers of this game and, as an avid gamer himself, he can provide insight to the needs and wants of the target audience.

- 1) "I play video games to unwind and to have fun."
- 2) "I am very familiar with RPGs with games like Breath of the Wild and Fallout New Vegas. I enjoy passing my time with playing both Western and Japanese varieties of RPGs"
- 3) "The main difficulty I have is simply not having enough time or forgetting what I was doing after taking an extended break from a game. Between school and work, it is often difficult having time to play games when there are assignments that I need to prioritize."
- 4) "I mainly enjoy being able to explore a world that is unlike anything that can be found on Earth. It is fun being able to explore distant lands in a fantasy setting like in Breath of the Wild or even surviving on a whole different planet like in Xenoblade X."

- 5) "I do not enjoy formulaic quests. One of my biggest problems with Fallout 4 is virtually every quest given by Preston Garvey is 'a settlement needs your help, go kill the ghouls/ super mutants/ raiders and help them". There is no variation. There is no world building. There are no characters being developed. Those kinds of quests just feel like a shallow experience and, while we create our own game, I would prefer us avoiding those kinds of missions".
- 6) "I would add emphasis on worldbuilding. I want there to be a sense of how something works. For example, if a shop stocks a certain item, there should be trade routes that mention how the shop gets those items."
- 7) "I heavily prefer the Nintendo Switch. Most of my time each day is spent at UNR so it is awesome having a device that I can bring with me."
- 8) "It depends on the game, but usually it's around an hour. However when it is a new game that I am excited to experience, it could last three or four hours"
- 9) "Very little. Realism isn't important to me whereas a logical flow. I mean, if there is a cold environment, it makes sense for characters who wear loose clothing to be cold as well. The world doesn't need to be realistic compared to our own reality, whereas it needs to be one that makes sense to itself"
- 10) "Very little. It depends on how much I know I am going to enjoy the game. I was more than willing to spend money on the collector's edition of Xenoblade Chronicles 2 because I knew it was a game I would sink hundreds of hours in."
- 11) "Very little. How much time I spend in the game is really a matter of how much I enjoy it because, if it is a truly captivating game, it is something I am willing to come back to frequently."
- 12) "Usually it is when I have to go to sleep or when there is other work that I need to start doing. I can't really focus on gaming when I know there are important things that I need to get done first."

Sean mainly plays games for entertainment, and enjoys many RPGs. He appreciates expansive worlds and the details that go into making them immersive. While pure realism is not very important to him, he prefers game worlds that "make sense" and do not break his suspension of disbelief. He also likes variety in his gameplay, so that the game does not get repetitive and boring. Sean typically puts at least an hour into his game sessions, and usually only stops if he has something more urgent to do. He finds the Nintendo Switch to be a perfect gaming device, since it allows him to play anywhere, and he does not have to be tied down to a television to play a console game.

Matthew Trenner was interviewed because he frequently plays games similar to the one we are creating for this project, and he is an excellent choice to provide feedback as a representative of the demographic we are aiming to achieve for the game. The following is a list of the answers he gave in response to the interview questions:

- 1) "I play video games to relax and have fun."
- 2) "I am very familiar with RPGs."

- 3) "As far as difficulty, I would say if it does not have a good story, it's difficult to slog through it, but game mechanics can make up for it."
- 4) "I would like to see the ability to ride the dragons, it sounds like fun."
- 5) "I dislike 'smash the button' mechanics. If I have to rapidly press a button I'm not really engaged."
- 6) "I wish RPG's had story ratings. Like if on the box it said 'This game actually has a good story, and XYZ other person backs up my claim!'"
- 7) "I prefer to play on PC."
- 8) "A typical session? I tend to play 3-4 hours."
- 9) "Realism is only important as far as using it for a setting can go. Which is to say, if you are making a gritty crime thriller RPG realism could very well play a big part."
- 10) "If it costs [\$]60+ for the standard copy, I'm not buying it."
- 11) "The length does not really matter for me, it just can't be really short, otherwise it feels like a phone game."
- 12) "The reasons to stop playing video games? I stop because I have to work or study or something along those lines, why I can't play all day like I used to!"

The answers provided by Matthew provide some valuable insight into the desires that some potential customers may be interested in seeing in a game and some of the constraints they place on some of the types of games they will play.

As someone that self-describes themselves as a gamer, Matthew places high emphasis on good story, fun game mechanics, positive reviews, and affordable pricing. In his opinion, having both a good story and fun mechanics can make a great game, but if for whatever reason development time is limited and only one aspect should be focused on, that aspect should be the game mechanics. A poor story may make a game forgettable, but if the game simply isn't fun to play, it is doomed to be a failure.

High Level Business Requirements

- 1) The goal of this project is to create a digital RPG focused around the fighting and capturing of dragons throughout the world.
- 2) The goal of the game is to provide its players with several hours of a fun and engaging experience through interesting storytelling and unique gameplay.
- 3) The player will control the protagonist of the game and fight, capture, and gain information on various dragons throughout the game.
- 4) The game will offer randomly generated content for the player to complete, such as basic randomized goals, randomized areas that are different each time they are visited, and randomized enemies. Randomized content increases the general amount of time that a player will stay engaged with the game.
- 5) The game should be marketable towards gamers of every age group, with content that various audiences can find enjoyable. The plot of the game should be engaging enough to keep an adult player interested, but not too complex for a younger player.
- 6) The game should contain minimal profanity and no content that is inappropriate for children to ensure that it remains marketable to that demographic.
- 7) The game will be distributed primarily through digital downloads, rather than physical disks.
- 8) Most assets should be created by Team 18 rather than purchased from other sources to minimize costs and avoid any issues with intellectual property.
- 9) The game should have at minimum a PC version. Versions for other platforms may be developed if time permits.

Technical Requirements Specification

[L1] Denotes requirements we plan to implement by Spring 2019.

[L2] Denotes requirements we plan to implement by May 2019.

[L3] Denotes requirements we may implement if time permits.

Functional Requirements:

FR01	[L1]	The game will have a main menu display
FR02	[L1]	The player will be able to control a character on a two-dimensional map of the game world.
FR03	[L1]	The player will be able to encounter, fight, and capture various types of dragons.
FR04	[L1]	The player will be able to select their captured dragons and train them to increase their combat skills.
FR05	[L1]	The player will gain information on a specific type of dragon the more it is encountered/captured.
FR06	[L1]	The game will have an in-game menu with different sections
FR07	[L1]	The game will have options to adjust volume and input devices
FR08	[L1]	The world map will be comprised of 16x16 tiles
FR09	[L2]	The game will have visual options for colorblindness modes (black & white and inverted colors)
FR10	[L2]	The game will have music audio.
FR11	[L2]	The player will be able to visually customize their character.
FR12	[L2]	The game will have character dialogue boxes
FR13	[L2]	The player will have different means of capturing dragons, some of which may be more effective than others.
FR14	[L3]	All sprites will be fully animated.
FR15	[L3]	The game will feature a morality system (ie. good vs. evil), which is impacted by the player's actions.

Non-functional Requirements:

NFR01	[L1]	The game will be playable on Windows platforms.
NFR02	[L1]	The game will be controllable with both a keyboard & mouse setup and a gamepad.
NFR03	[L1]	The game will have pixel art reminiscent of Super Nintendo RPGs.
NFR04	[L1]	The game will be developed using Unity.
NFR05	[L1]	The game will be seamless with no more than two seconds of loading when entering a new scene.
NFR06	[L1]	The game's assets will be loaded from disk through the "streamingAssets" folder
NFR07	[L1]	The game will be saved using JSON Serialization
NFR08	[L2]	The game will have an intuitive user interface.
NFR09	[L2]	The game will not have any loading screens longer than three seconds.
NFR10	[L2]	The player will be able to have at least three character save slots.
NFR11	[L2]	The game will support multiple monitor resolutions and aspect ratios.
NFR12	[L3]	The game may release on the Nintendo Switch

Use Case Modeling

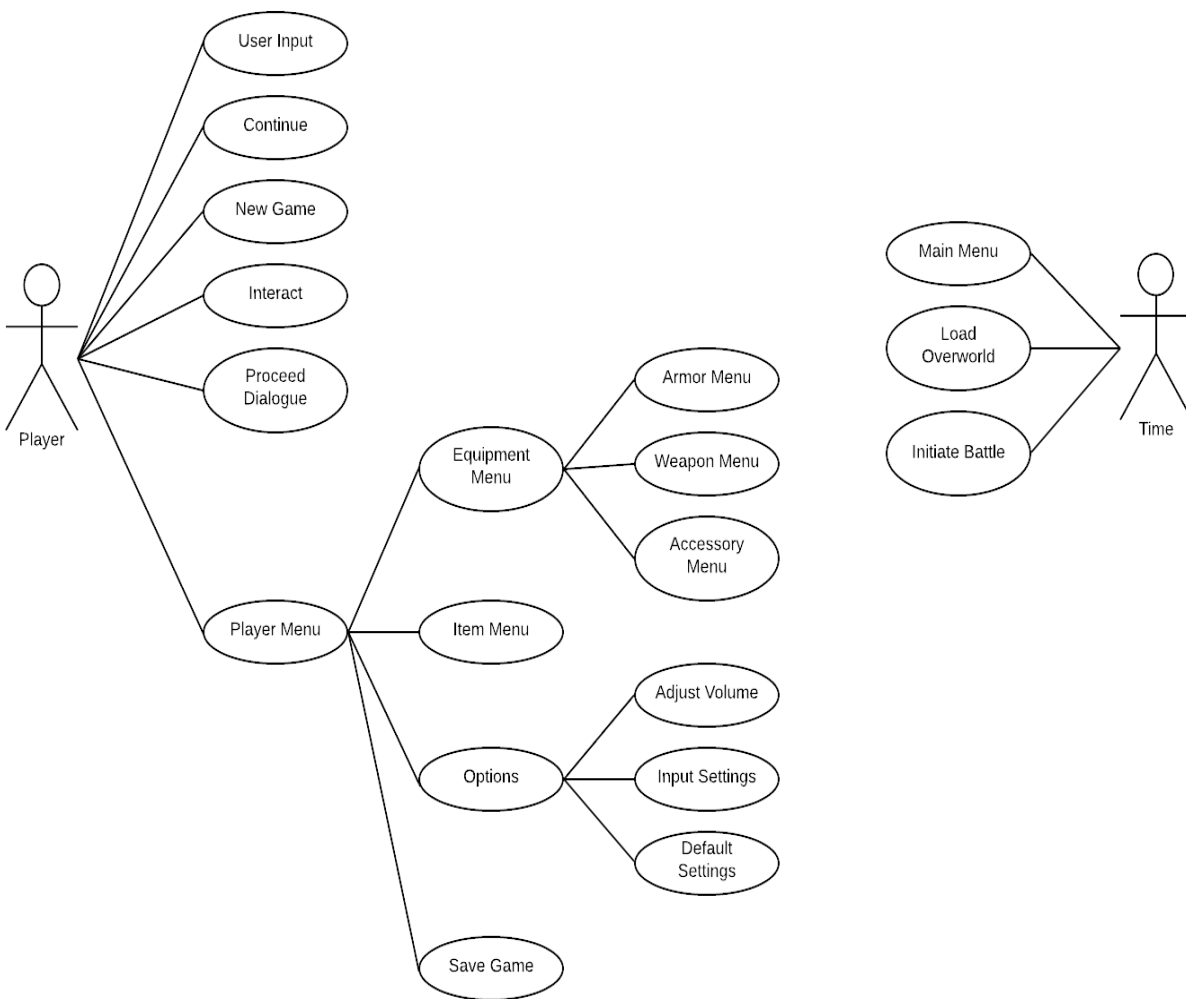


Figure 1: Use case diagram for our game

Use Case Descriptions

Identifier	Name	Description
UC01	User Input	The game will detect input from keyboard or from a gamepad. This will be used to navigate menus and control the main character during gameplay.
UC02	Continue	Loads the game from where the player saved
UC03	New Game	If a save file exists, it will be deleted and a new one that starts from the beginning of the game will be created.
UC04	Interact	The player may interact with different virtual objects within the world.
UC05	Proceed Dialogue	When an action button is pressed near certain NPCs, a dialogue menu will appear.
UC06	Player Menu	The player can pause the game and open a menu with several options, allowing the player to see their equipment, items, or dragons, save their game, or change their options.
UC07	Equipment Menu	This menu shows all of the player's equipable items with submenus for each type of equipable item. It also provides the stats for the players equipped items.
UC08	Armor Menu	This menu displays each armor that the player is carrying. Armor is used to protect the player from attacks. The player may get a description, drop, or equip any of the armors in this menu.
UC09	Weapon Menu	This menu displays each weapon that the player is carrying. Weapons are used for fighting enemies. The player may get a description, drop, or equip any of the weapons in this menu.
UC10	Accessory Menu	This menu displays each accessory that the player is carrying. Accessories can augment the player's abilities. The player may get a description, drop, or equip any accessories in this menu.
UC11	Item Menu	This menu has all items that the player is carrying. Unlike equipment, these cannot be equipped but they can still be used in battle or in the overworld.

UC12	Options	This menu allows the user to adjust settings for input, audio, and visuals.
UC13	Adjust Volume	Allows the user to change the volume of sound effects and music.
UC14	Input Settings	Allows the user to change between a keyboard device to a gamepad device and vice versa.
UC15	Default Settings	Resets the audio and input settings to their defaults.
UC16	Save Game	The player's current progress and state are saved to the system's memory and can be loaded at a later time.
UC17	Main Menu	This is the initial scene in the game, displaying buttons for an options menu, continuing the adventure, or starting a new game.
UC18	Load Overworld	When a game is loaded, the player will be placed into the location in the overworld that they saved.
UC19	Initiate Battle	When the player encounters an enemy, a new scene will load and the player will have a turn-based battle.

Extended Descriptions

Use Case: User Input
Tag: UC01
Actors: Player
<p>Preconditions:</p> <ol style="list-style-type: none"> 1. The player has their preferred input device (keyboard or controller). 2. The input device setting in the options menu is set to the player's preferred input device. 3. The game has been loaded.
<p>Events:</p> <ol style="list-style-type: none"> 1. The player presses a key or button recognized by the game. 2. The game responds based on the button pushed. <ol style="list-style-type: none"> a. If a directional key or button is pushed, the character or cursor (depending on the game's state) will move in the indicated direction. b. If the "select" key or button is pushed, the character will interact with whatever is in front of it, or the element the cursor is pointing to will be selected, depending on the game's state. c. If the "menu" key or button is selected, the player menu will open. d. If the "exit" key or button is pushed, the current menu will be closed.
<p>Postconditions:</p> <ol style="list-style-type: none"> 1. The player character's or cursor's position changes, an interaction with an object or character in the game world occurs, a selection is made, or a menu closes.

Use Case: Proceed Dialogue
Tag: UC05
Actors: Player
<p>Preconditions:</p> <ol style="list-style-type: none"> 1. The player has interacted with an object or a NPC or triggered a cutscene. 2. The current game screen shows a dialogue box.
<p>Events:</p> <ol style="list-style-type: none"> 1. The current line of dialogue appears in the dialogue box. 2. The player presses the "select" key or button.
<p>Postconditions</p> <ol style="list-style-type: none"> 1. The current line of dialogue disappears and the next line appears in the dialogue box, or the dialogue box closes if the current line is the last line.

Use Case: Player Menu
Tag: UC06
Actors: Player
Preconditions: <ol style="list-style-type: none">1. The game state is in the overworld.2. The game state is not in a battle, shop, dialogue screen, or cutscene.
Events: <ol style="list-style-type: none">1. The player pushes the “menu” key or button.2. The game world pauses; nothing in the overworld will move or act in any way, including the player character.3. The player menu appears on the screen, with several different options that allow the player to see information about their character and inventories and modify them in various ways, open the options menu, or save their game.
Postconditions: <ol style="list-style-type: none">1. The game world is paused except for the menu.2. The player menu is open.3. The player can traverse the player menu with a cursor by pushing the directional keys or buttons.4. The player can make a selection in the menu by pushing the “select” key or button.5. The player can exit the menu and unpauses the game world by pushing the “exit” button.

Requirement Traceability Matrix

	FR01	FR02	FR03	FR04	FR05	FR06	FR07	FR08	FR09	FR10	FR11	FR12	FR13	FR14	FR15
UC01	x	x	x	x		x	x								
UC02	x														
UC03	x														
UC04		x	x	x	x									x	x
UC05		x										x		x	x
UC06						x					x				
UC07						x					x				
UC08						x					x				
UC09						x					x				
UC10						x					x				
UC11						x									
UC12						x	x		x						
UC13						x	x			x					
UC14	x	x				x									
UC15						x	x								
UC16						x									
UC17	x														
UC18								x						x	
UC19		x	x										x	x	x

Initial Snapshots

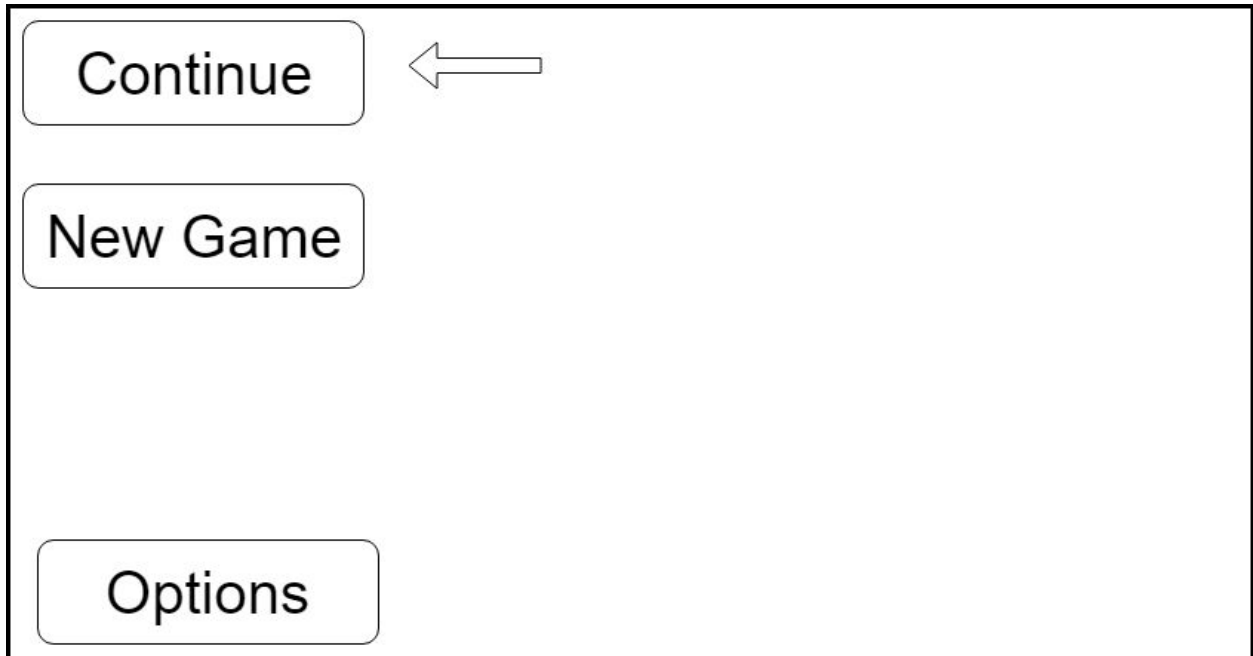


Figure 1: Main Menu. The screen shown when the game starts.

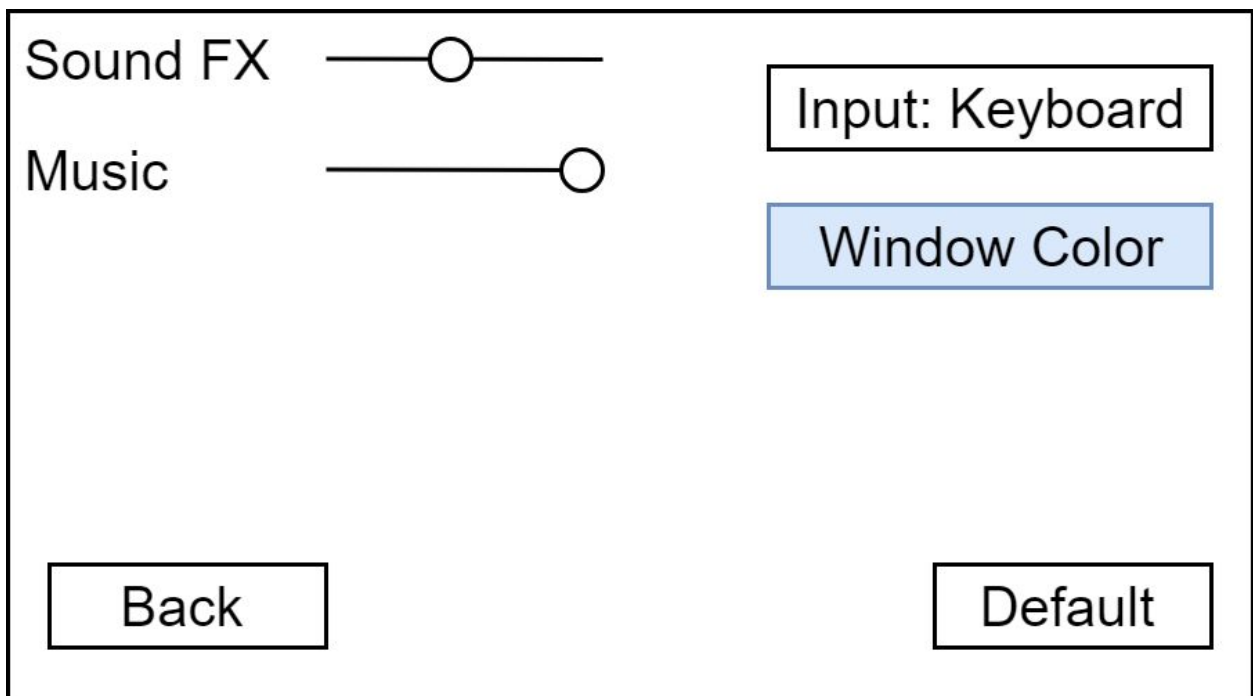


Figure 2: Options Menu to modify different sound and input settings or reset them to the default settings.

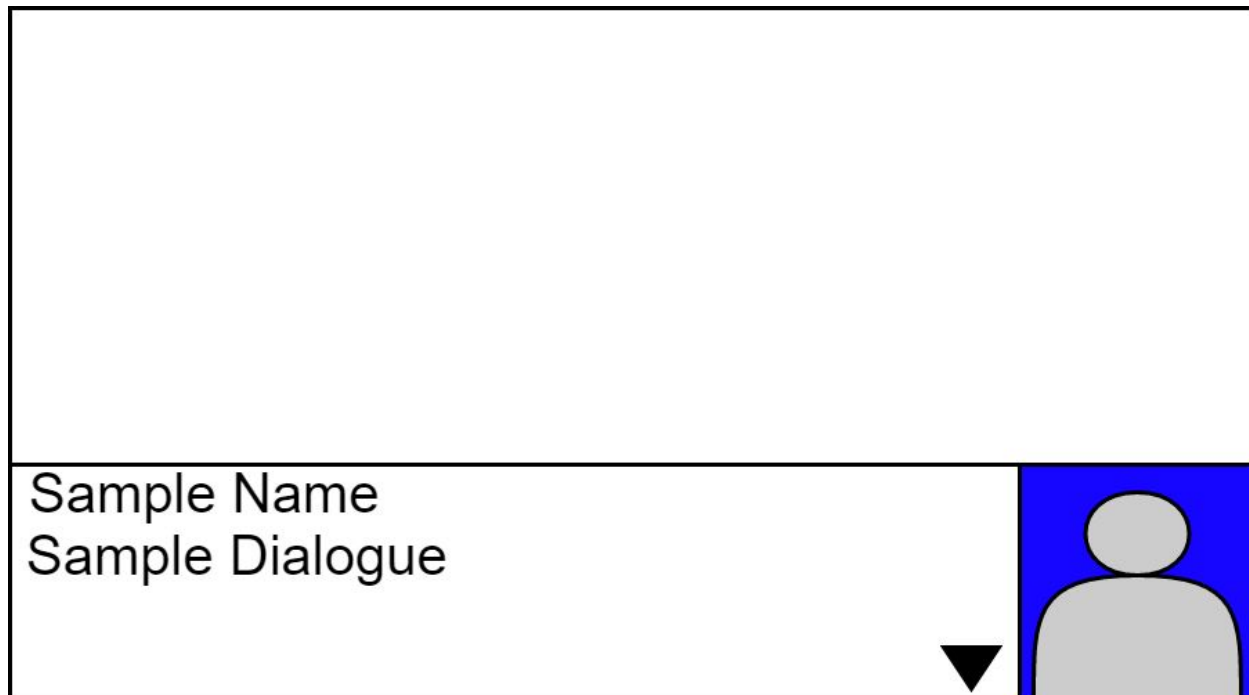


Figure 3: NPC Dialogue Menu. When the player presses the action button near an NPC, they will speak to the player

Shield of Shielding	◀ Cost: 500	Gold: 15000
Sword of Slashing		Equipment
Health Potion		Sell
Magic Potion		
Bronze Armor		
Bracelet		
Item Description		

Figure 4: Shop Menu. When the player talks to a shopkeeper, they may purchase items for their quest.

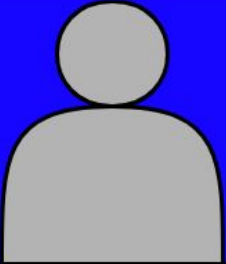
	Armor Accessory Weapon	Sample Item A Sample Item B Sample Item C Sample Item D
	Attack 240 Defense 50 Agility 75 Health 350 Magic 60	Gold: 10, 413

Figure 5: Equipment Menu for when the player is managing their weapons/armor, taking potions




 				
				
Fight	Magic	Defend	Item	Flee

Figure 6: Battle Menu. When the player encounters an enemy, they will enter a scene where they can make turn-based decisions for battle.

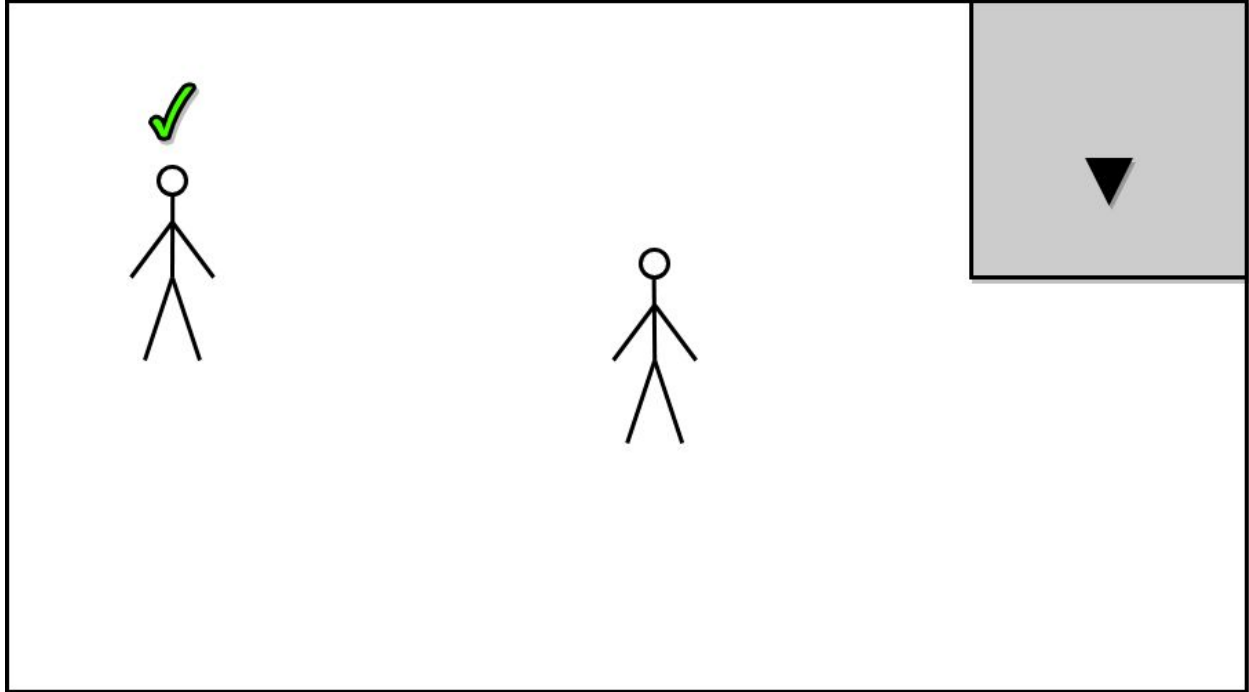


Figure 7: Overworld Screen. During overworld exploration, the UI will be very minimal only displaying visual cues for NPCs with quests and a minimap.

Glossary

Role Playing Game (RPG)	A genre where players assume the role of a fictional character who will have an adventure in their world.
Sprite	A 2D image
Super Nintendo Pixel Art	Minimalistic artwork where the image is comprised of a small pixel resolution and a few colors per image.
Unity	A game engine designed to create 2D and 3D games
Game Engine	Software that can be used to develop a video game
Frame Rate	The number of visual updates per second
NPC	Acronym for Non-Player Character, which refers to any in-game character that cannot be controlled by the player
Player	The end user of the game
UI	User Interface for the player to interact with the software
Quest	A mission that the player may complete
Overworld	The area in the game that connects all of the locations
Turn-based Combat	A battle system in which the player takes their turn and then the enemy takes their turn.
Inventory	A list of virtual items that the player is carrying.
Gameplay	The actions that the player takes while playing the game.
Plot	The main sequence of events in the game.
Gamepad	A handheld controller for video games.
Equipment	Virtual items that can be picked up by the game's main character.
Video Game	A game played by manipulating images displayed on a monitor or television.
Prototype	A preliminary model design to test the functionality or the design of a product.
Tilemap	A 2D grid of images that are the same distance apart.
Scene	A distinct environment of the game.

List of References

Book:

Introduction to Game Design, Prototyping, and Development Second Edition (Jeremy Gibson Bond)

Jeremy Gibson worked as both a professor of game design and a game developer. He wrote this book to teach others how to prototype a game and develop it into a fleshed-out, playable product. The book emphasizes using Unity and C#, but the skills can be applied to making a game in any language and any engine.

Reference Articles:

Unite Austin 2017 - Writing High Performance C# Scripts

<https://www.youtube.com/watch?v=tGmnZdY5Y-E>

Unite is Unity's conference where the developers of the Unity engine discuss upcoming features and provide expert tips for how developers may improve their games from both a technical standpoint and a design standpoint. This talk discussed how to improve performance of Unity games and some upcoming features, such as C# 7.0 features and the Unity Job System, that will improve performance of games.

GDC 2017 - Hitchhiker's Guide to Rapid Prototypes

<https://www.youtube.com/watch?v=sYWkiv1hTPM>

Game Developers Conference is the gaming industry's largest global event where game developers discuss very helpful tips to both novice and expert developers to improve their games. This talk discussed how to quickly build a prototype that tests the core functionality of a game. Some of the helpful tips were: focusing on urgent goals and creating the minimum viable interaction.

GDC 2016 - 8 Bit & '8 British' Graphics-Outside the Box

<https://www.youtube.com/watch?v=aMcJ1Jvtef0>

This GDC talk discusses how to create professional-quality pixel art with a small, 8-bit, color palette. The first thing he discusses is how artists can reuse the same colors to create a different atmosphere in their scene. He also demonstrated that a 256 color palette can be used to create very impressive imagery such as waterfalls and snowy environments.

Websites:

Unity User Manual: <https://docs.unity3d.com/Manual/index.html>

The official Unity manual contains descriptions and examples on all the features that Unity provides. This includes tutorials on creating 2D games, scripting in C#, creating audio, using the UI system, and using the physics system. It also has documentation on how to use the Unity API. Unity's manual is well-organized, so it will be beneficial for learning how to implement certain mechanics into our game.

Brackeys: <http://brackeys.com/>

The Brackeys contains many tutorials for creating a variety of different types of games in Unity. He has tutorials on platformers, Pong, and a 3D RPG. He has also done tutorials on more specific subjects such as using ScriptableObjects. The Brackeys website contains free assets that could be used for prototyping our game. The only drawback is that, since Brackeys has been doing tutorials since 2012, some of the tutorials use Unity functions that have since been deprecated.

quill18creates YouTube Channel: <https://www.youtube.com/user/quill18creates>

This YouTube channel contains many helpful tutorials for creating fleshed out games in Unity opposed to creating one-off games. For example, his Base-Building Game tutorial goes in-depth to creating tile systems, loading files from disk, AI Pathfinding, and other features to create a base-building game. He has also done tutorials for creating a Civilization-style game in a hexagonal grid. These tutorials will help us understand how to create a game with a larger scope than the other tutorial sites provided.

Contributions of Team Members

Sean spent four hours creating initial snapshots using Draw.io, writing the introduction, and defining some of the important terms in the glossary.

Jonathan spent approximately two hours writing the business requirements, most of the function and non-functional requirements, and interviewing and analyzing the responses of Matthew Trenner.

Christine spent about three hours writing interview questions 4, 5, and 6, analyzing Sean Steven's interview results, creating the UML Use Case diagram, writing two of the short-form detailed use case descriptions, and writing the three detailed templates for the use cases.

Ryan spent approximately two hours modifying the functional and non-functional requirements and creating the requirement traceability matrix.