

# ÉCOLE POUR L'INFORMATIQUE ET LES TECHNIQUES AVANCÉES

UNDERGRADUATE 1<sup>st</sup> Year SEM. 2



**Project Q**  
**FAUST**

**POLLO Y PAPA**

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IAN TERNIER

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# Chapter 1

## INTRODUCTION

Faust, is a rogue-like game influenced by Dead Cells and Hades, which presents the story of a man driven with the obsession of gaining omnipotence. This storyline will be explored further in the report. Faust is a 2-dimensional game created by Pollo-Y-Papas (team name), with a pixel art style and progressively increasing enemy difficulty. While rogue-like games are single players, Faust will have a multiplayer option for the players to choose.

In this report we will explore the process of the creation of the game, this includes the difficulties we experienced, what we learnt, as well as what needs to be done for the next defenses.



**Figure I:** Beta Version of the Faust logo

## Chapter 2

# MODIFICATION TO THE BOOK OF SPECIFICATIONS

During the process of making the game, some assigned roles were changed. The following table shows what each person worked on.

This section states the distribution of the major elements that will be worked on for the Game. The word “Head” implies that the person is in charge of the task while, “Vice-Head” is someone that will be helping the person complete it.

|   | David Calderon | Maxime Bardouil | Raj Mahajan | Wadhah Ouled-Ameur |
|---|----------------|-----------------|-------------|--------------------|
| <b>Project Manager</b>                    |                |                 | X           |                    |
| <b>Storyline, Character, Stage Design</b> |                | Head            |             |                    |
| <b>Physics of the Game</b>                | Head           |                 | Vice-Head   |                    |
| <b>Map Generation AI</b>                  |                |                 |             | Head               |
| <b>Animation</b>                          | Vice-Head      |                 | Head        |                    |
| <b>Interface</b>                          |                | Vice-Head       |             | Head               |

# Chapter 3

## CURRENT PROGRESS

The next section will explain everything we have done so far and if needed explain how this was accomplished. For the first defense, Pollo-Y-Papa was supposed to finalize the storyline, create a stage, a character and some enemies, learn how unity works and finally put everything together to create a prototype of the game. The following table, from the book of specifications, explains each task that needed to be completed for this defense.

| Presentation       | Tasks  |
|--------------------|--|
| 7 - 11 March, 2022 | <ol style="list-style-type: none"><li>1. Finish Storyline<ol style="list-style-type: none"><li>a. Where<ol style="list-style-type: none"><li>i. Where is the game taking place</li><li>ii. Different Biomes</li></ol></li><li>b. What &amp; Why<ol style="list-style-type: none"><li>i. Concrete In-game Storyline</li><li>ii. Goal and reasoning of the characters</li></ol></li></ol></li><li>2. Stage &amp; Character Design<ol style="list-style-type: none"><li>a. 1 Character, few Enemies</li><li>b. Implemented into the game</li><li>c. Stage design</li></ol></li><li>3. Basic Physics &amp; Learn Unity<ol style="list-style-type: none"><li>a. Be able to navigate Unity, create 2D Objects, add physics to them</li><li>b. Learn Unity Game Syntax</li></ol></li><li>4. Prototype<ol style="list-style-type: none"><li>a. Single room</li><li>b. Character able to perform basic actions</li></ol></li><li>5. Start Building Website<ol style="list-style-type: none"><li>a. Summary of the progress so far</li></ol></li></ol> |

### 3.1 Storyline : Maxime François-Bardouil

Faust tells the story of a man seeking Mephistopheles, a demon who holds the key to all the knowledge in the universe. After finding a clue as to where the demon is located, Faust starts a journey through numerous forbidden lands to achieve his goal. His mission takes him to multiple biomes, with various different sceneries, allowing the player to avoid redundancy and enjoy new scenery. In the game, Faust will use powers that he gained during the gameplay, and these powers are the bits of knowledge that the demon Mephistopheles owns, the very thing Faust yearns for.

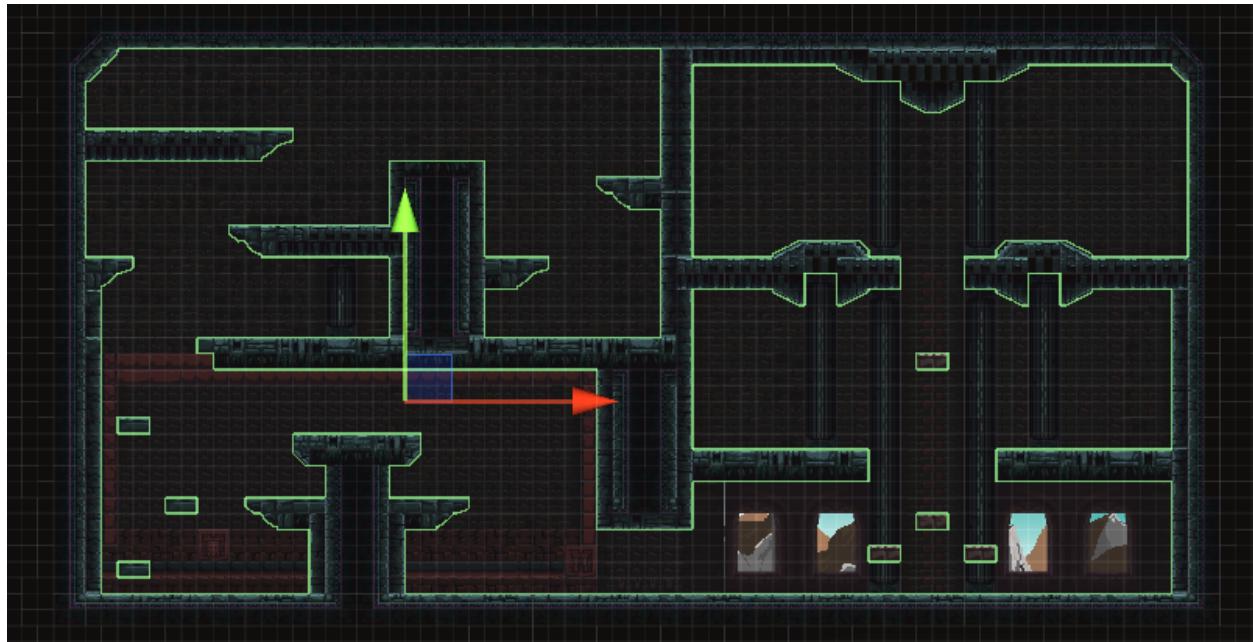
This story is based on a German story of a man and demon of the same name. In that story Faust made a contract with the demon, exchanging his soul for all the knowledge in the world.



**Figure II:** Faust and Mephistopheles

### 3.2 Map Design: Wadkah Ouled Ameur

When it came to map Design, the first step was to find an appropriate tileset. After doing so and after uploading the tileset, we had to adjust the tileset so it can be used on the tilemap. To do this first we changed the pixel per unit value of the set to 16, then using the sprite editor we sliced the Image so that it was divided to multiple squares. After preparing the tileset we then created a tile map in the scene for the map prototype. In the tile map grid we create 3 layers, the terrain, the walls and the background, so that each layer interacts with other layers and the player differently. The next step was to design the map using the tile pallet and the tilesset that we had prepared.



**Figure III:** Map Prototype

After creating the map we added the tilemap collider and composite Collider to the terrain layer of the map so that the player could interact and collide with the surfaces. It is also worth noting that the map design was adjusted multiple times to fit the characters better and to fix issues that were not noticed beforehand.

### **3.3 User Interface : Maxime François Bardouil & Wadhah Ouled Ameur**

To work on the User Interface, we started by creating multiple unity scenes representing the multiple menus (Start menu and Death menu). After designing a background for each menu and deciding on which colors to use, we added buttons that can be used to navigate between the scenes. In the start menu, we implemented a start game button, which takes us to the level, an option button, which will be used to change the game settings, and a quit button, which fully exits the game. In the death menu we added a main menu button to take us back to the main menu and a start new game button to instantly enter a new game.



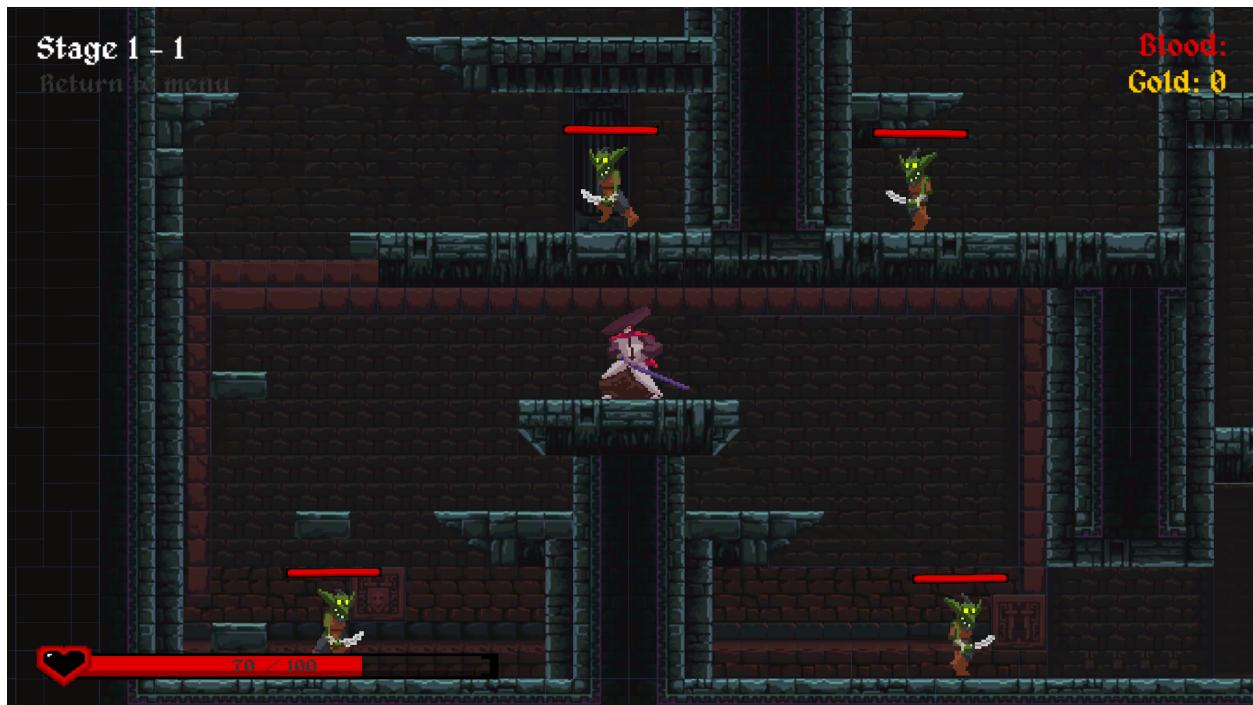
**Figure IV:** Start Menu

In the death menu we added a main menu button to take us back to the main menu and a start new game button to instantly enter a new game.



**Figure V:** Death Screen

In addition to the menus, we also set up an ingame interface for the player displaying Health, Amount of Resources and the current stage. For the health bar, we set up a slider which represented the percentage of current health (compared to max health), and linked it to the main character via code. The resources and current stage have not been linked by code yet because those things have not been implemented yet.



**Figure VI:** In-Game Overlay

For the enemies, we created a separate UI linked to them directly and repeated the steps used for the main UI health bar.



### 3.4 Player : Raj Mahajan & David Calderon

Raj Mahajan : Animation

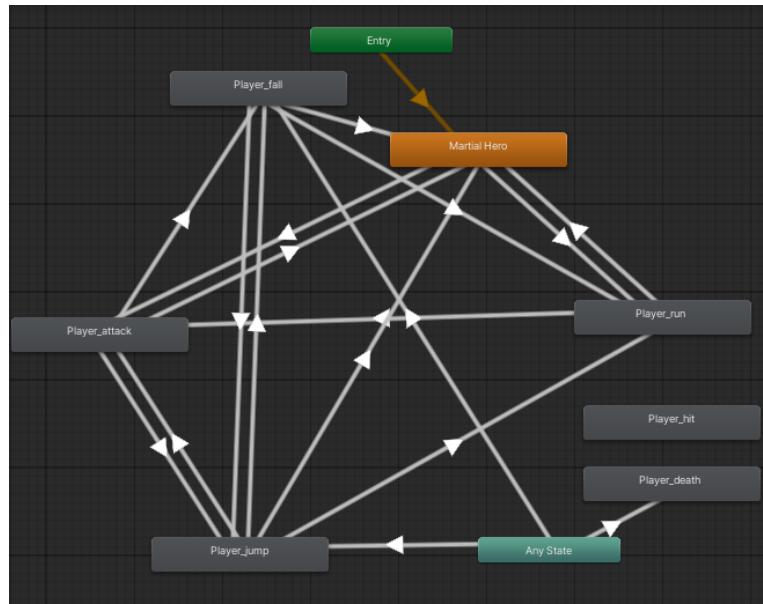
David Calderon : Physics

First we found an asset that we could import into Unity and deemed it to be the Player of the game. The following picture shows the character we choose for the game.



**Figure VII:** Faust Design (Martial Hero)

There were 2 major parts for the Player. First was the Animation and second was the Physics behind it. Firstly, the animations were created by putting frames together and creating a loop. Then using Unity Animator, each animation was linked to another depending on some conditions. For example, if you are currently in the “Idle” animation (in the case of the picture below Idle animation is called “Martial Hero”) and want to switch to the running animation, you need to check if the player is moving hence creating a condition. Each arrow from an animation to another requires the fulfillment of some conditions. These conditions were fulfilled by writing some code that kept track of things such as the health or the speed of the character.



**Figure VIII:** Animator for the Martial Hero

Secondly, once the animations were created the physics was implemented. This included a body, called RigidBody, and a Box Collider to the character. Once this was done, code to move, jump, attack, was added, and a working character was born.

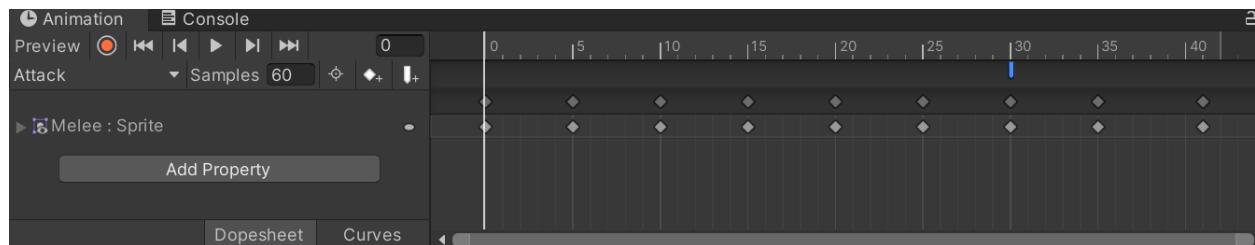
### 3.5 Enemies : Raj Mahajan & David Calderon

Raj Mahajan : Animation

David Calderon : Physics

There were two things needed to implement our very first version of a player/enemy mechanic, first patrolling and second attacking. The first one we accomplished by setting two boundaries between which the enemy could walk or “patrol”, breaking its route whenever the character entered within a range determined by us and returning to their route once we left their field of vision. Similarly, the attacking mechanic was implemented by setting a box of short range from the enemy, and by placing a trigger in a specific frame, that trigger can call a function which in turn targets the character.

Secondly, we added events to certain frames. For example, when an enemy attacks, we make an event such that the frame in which the attack reaches us we start an event in which the player takes damage. In the following image that frame is number 7 under the number 30.



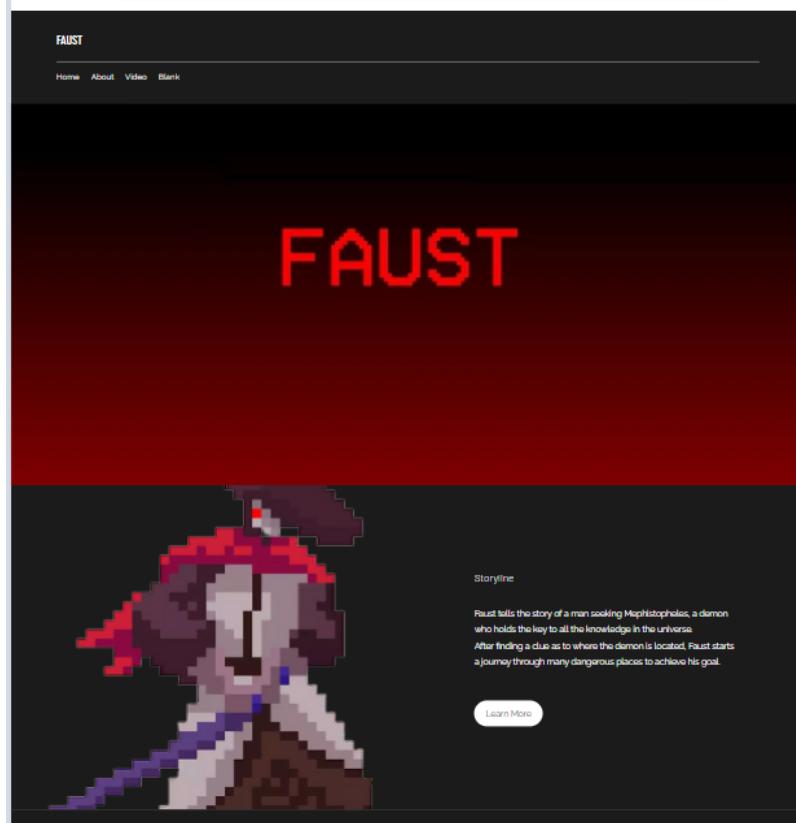
**Figure IX:** Adding an event to an animation

### 3.6 Website : Maxime François Bardouil

We created our website using Wix, an online service which provides the ability to create a website for free. On this website, we decided to include our logo, a quick summary of the storyline, and of our current progress.

***Website link:***

<https://polloyfaust.wixsite.com/website>



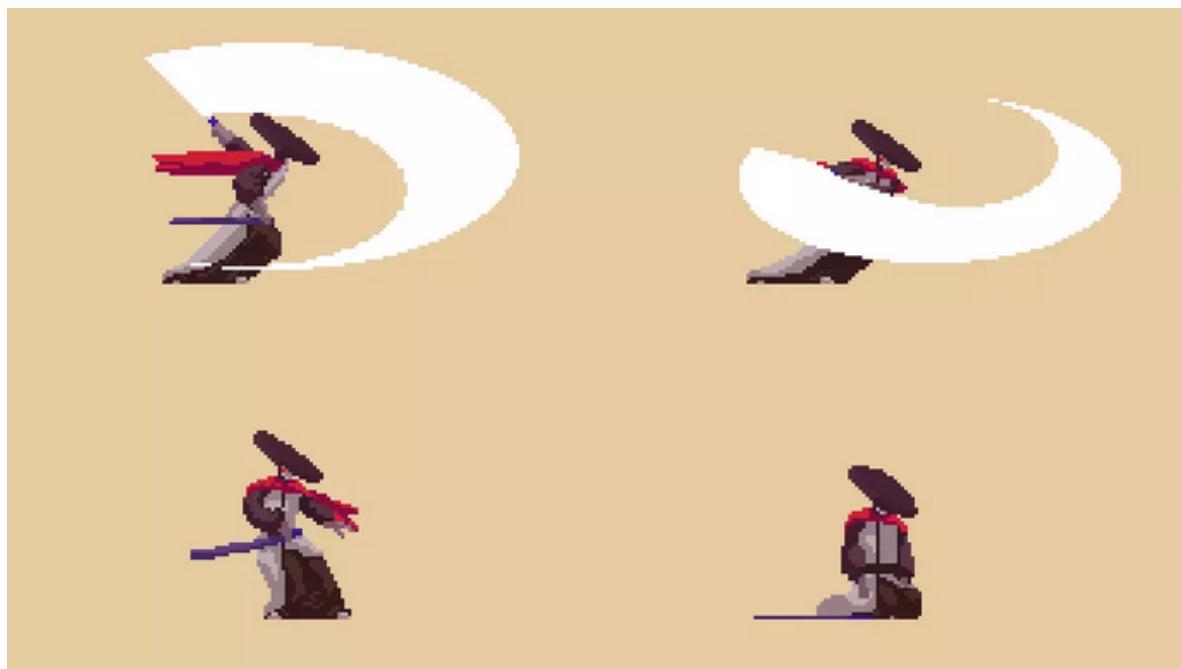
**Figure X:** Faust Website

## Chapter 4

# CHALLENGES: David Calderon

### 4.1 Unity Collaboration

As a collaboration tool we used “Unity Collaborate”, so that we could easily share and test different ideas, particular implementations and pieces of code each of us had assigned. Initially, we figured it was convenient because this service is integrated with Unity itself, but soon we came to the realization that whenever someone changed a script or even a small part of the configuration it forced us to pick between which one to choose, and the embedded merge option did not work very well. That is why for the future, we will try to use other solutions such as Git in conjunction with Unity Collaborate to make the process much smoother, as well as better assigning small functions and pieces of the project so that they can be better integrated into the main.



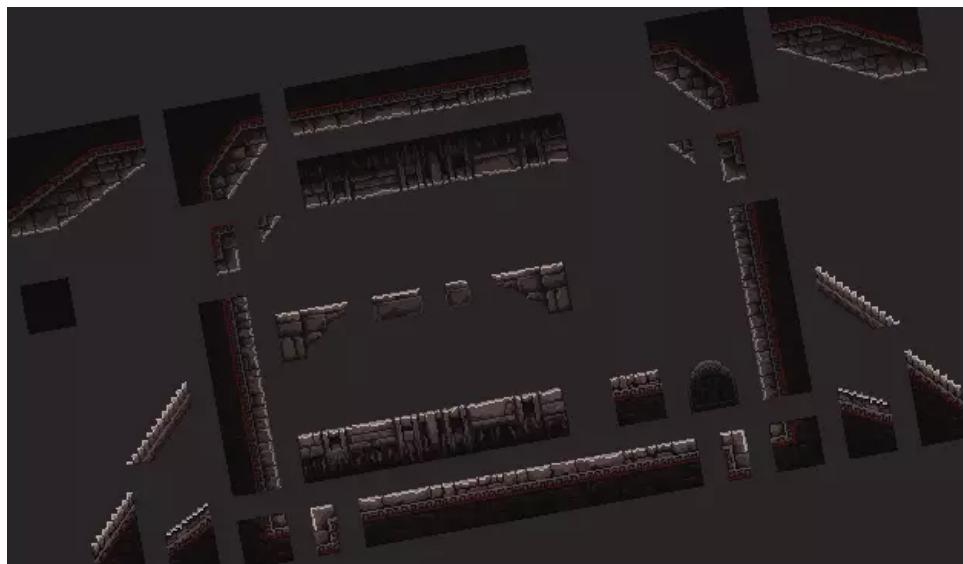
**Figure XI:** Player Animations

### **3.3 Animations and solutions**

As Unity beginners, we had some difficulties getting used to the whole range of functionalities the program offers, especially when it came to the whole animation system. Searching online for solutions only helped us so much, and we had to recollect information from multiple websites and Youtube videos in order to understand what we could do. And this applies to all of Unity really, finding the right library and the least time/resource expensive solution takes time, as there are way too many ways to solve the same problem and each one of them has to be evaluated for its upsides and downsides.

### **3.4 Finding assets**

Another big part of the challenges were related to finding the right asset pack for our project and to have the same style throughout the rest of the project, meaning consistency. When starting to work on it, we had the idea of how we wanted our game to look and we had the right asset pack for it, but when going further into it and designing even more maps, we realized that it was very limiting to have one asset pack to base everything upon, that is when we mixed different elements that looked good to us. Currently, we are looking for the best possible solution regarding this situation.



**Figure XII: Map Assets**

## Chapter 5

# FUTURE PROSPECTS

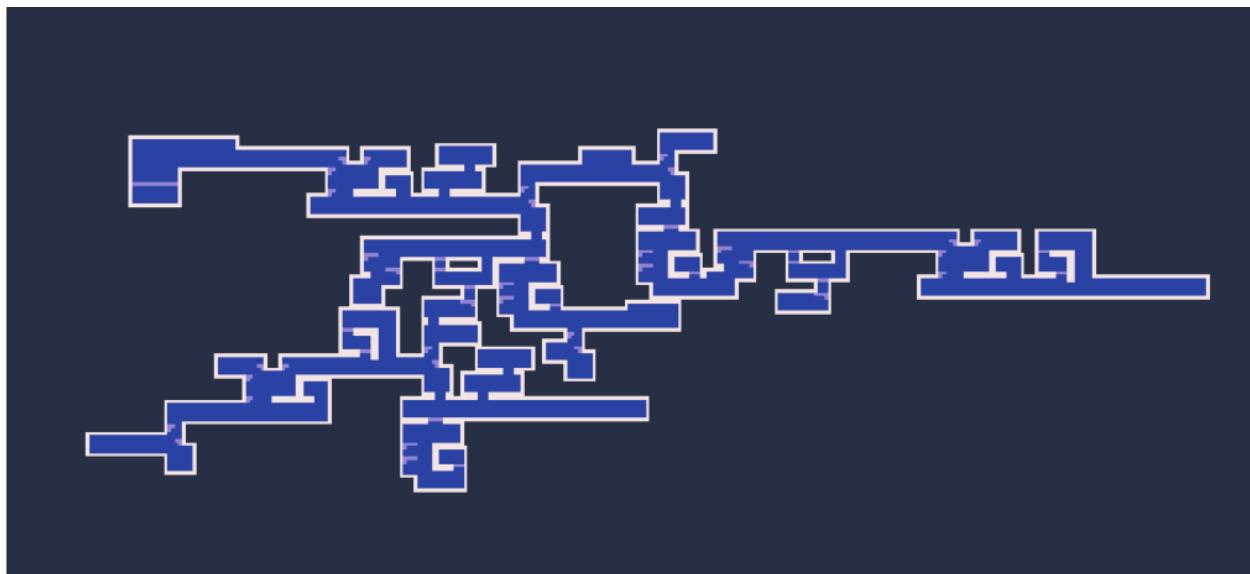
The following table presents the tasks needed to be completed for the next defenses. However, since we had time, the Character Animations are already done, and a basic Interface has already been created.

| Presentation        | Tasks  |
|---------------------|--|
| 25 - 29 April, 2022 | <ol style="list-style-type: none"><li>1. Interface<ol style="list-style-type: none"><li>a. Main Menu</li><li>b. In-Game UI</li></ol></li><li>2. Basic Map Generation<ol style="list-style-type: none"><li>a. Function Program but not necessarily optimized</li></ol></li><li>3. Character Animations<ol style="list-style-type: none"><li>a. Movement and action animations of characters</li></ol></li><li>4. Character Design<ol style="list-style-type: none"><li>a. All character, NPCs and weapons are designed and implemented into the game</li></ol></li><li>5. Intelligent AI<ol style="list-style-type: none"><li>a. Enemy Pathing and Attacking</li></ol></li><li>6. Network<ol style="list-style-type: none"><li>a. Finish All Research</li><li>b. Start implementation (as the game enters its finishing phase)</li></ol></li><li>7. Operational Website<ol style="list-style-type: none"><li>a. Website Interface</li><li>b. Summary of the Game</li><li>c. Track of Progress</li></ol></li></ol> |
| 6 - 17 June, 2022   | <ol style="list-style-type: none"><li>1. Installation Manual and Operating Manual</li><li>2. Map Generation<ol style="list-style-type: none"><li>a. Fully operational and optimized map generation AI</li></ol></li><li>3. Network<ol style="list-style-type: none"><li>a. Be able to host 2 player online game</li></ol></li><li>4. Save File<ol style="list-style-type: none"><li>a. Progress save after game exit</li></ol></li><li>5. Audio</li></ol>  |

|  |  |
|--|--|
|  | <ul style="list-style-type: none"><li>a. Ambient Sounds</li><li>b. In-Game Music</li><li>c. Sound Effects</li></ul> <p>6. Finish website</p> <ul style="list-style-type: none"><li>a. Downloadable versions of the game (with and without audio)</li><li>b. Timetable of the game progress</li></ul> |
|--|--|

## 5.1 Map

Since there are going to be various levels of biomes, a map can be implemented in which you can see the territories you have explored as well and other key points. A map as seen below can help the user orient himself in a big level.



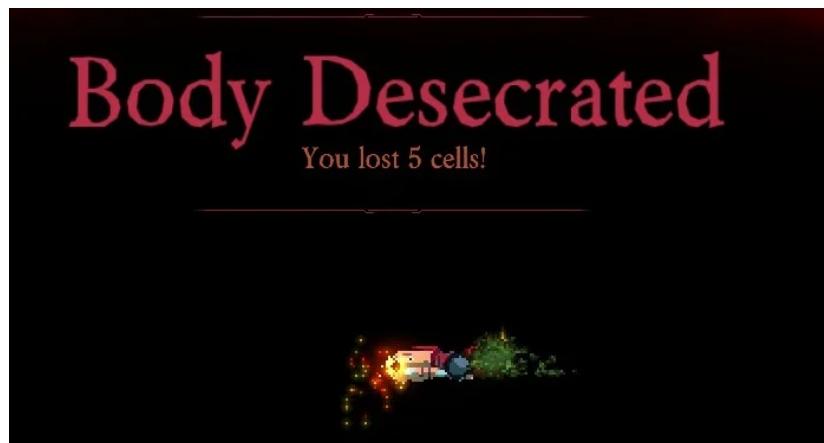
**Figure XIII:** Possible Map of the level the Player is in

## 5.2 Player Options

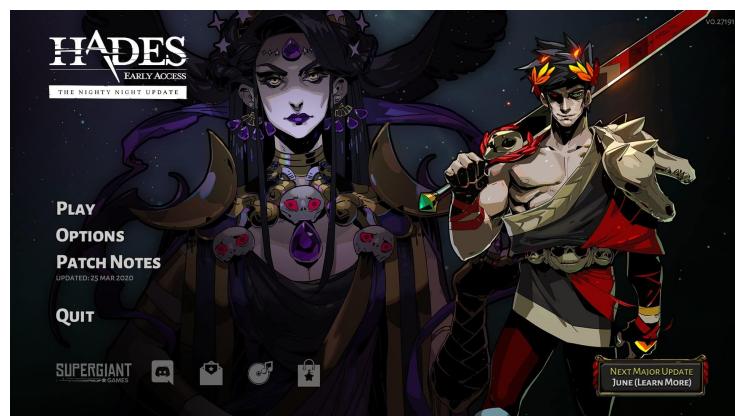
While the player has the basic actions needed, there still needs to be implementation of more complex actions such as equipping weapons. As the game progresses, the player gains abilities and weapons, and will be required to equip weapons. Secondly, an implementation of a dash will be needed as it is a common mechanism in games. Lastly, an animation of crouching is also needed to enhance the gameplay.

## 5.4 Design

While we do have a functioning UI (in-game and menu), the design for them can be improved, this can be done by adding a better transition from death to the “Restart Menu” such as Figure XIV. Lastly, having an image in the Main Menu of the Character will make the menu more attractive like in Figure XV.



*Figure XIV: Dead Cells Death Screen*



*Figure XV: Hades Main Menu*

# Chapter 6

## APPENDIX

### 6.1 Unity Assets

1. <https://assetstore.unity.com/packages/2d/characters/martial-hero-170422>
2. <https://assetstore.unity.com/packages/2d/environments/platformer-set-150023>

### 6.2 Font

1. <https://www.dafont.com/fr/alagard.font>

### 6.3 Tutorials

1. <https://youtu.be/hkaysu1Z-N8>
- 2.