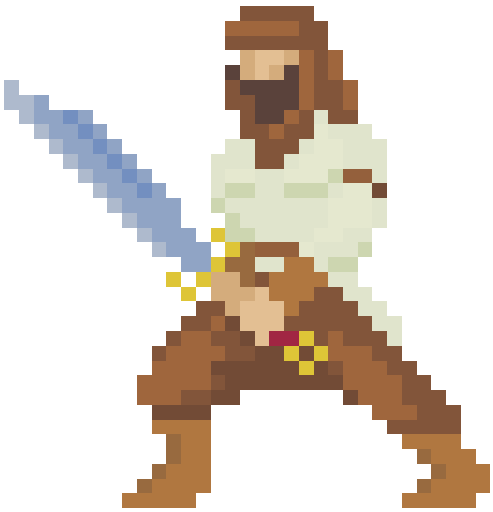
SAGUAROPHUS

Developers Manual



Version 1.0—Fall 2019

1. Overview

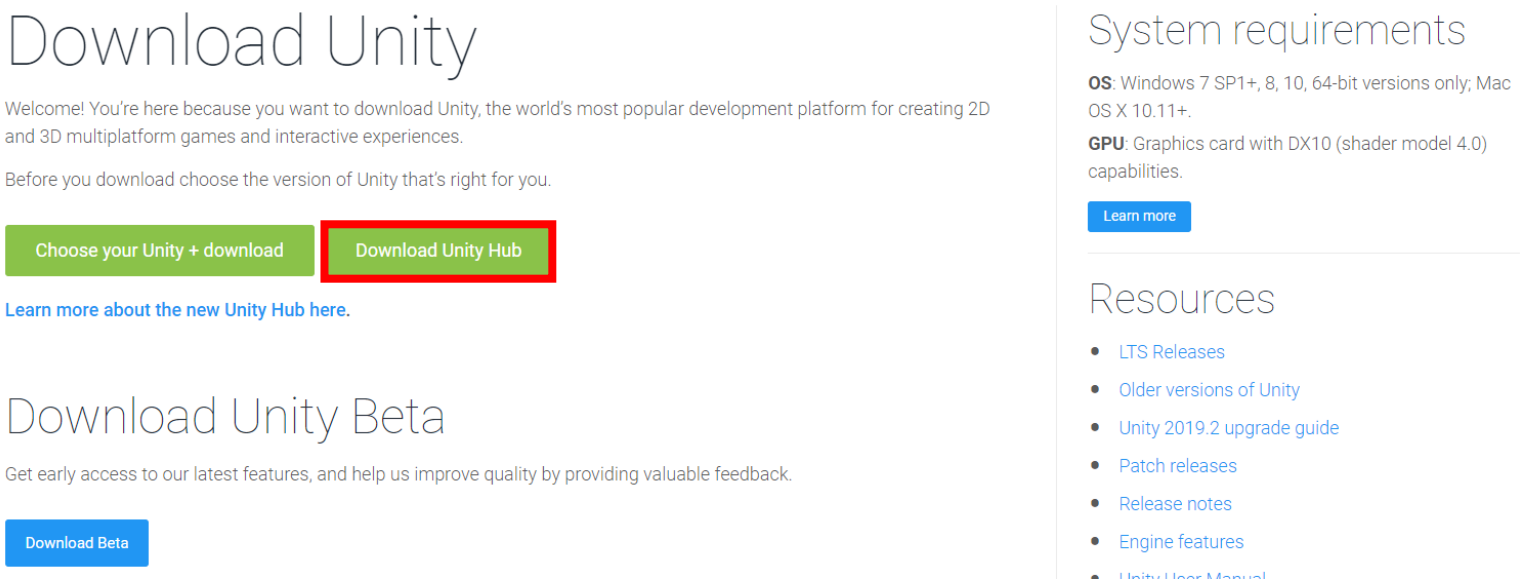
Saguarophus is a 2-D procedurally generated platformer game with no defined ending. Players explore the world, avoiding enemies and collecting powerups, attempting to make it as far as possible before their health runs out and the player dies, falling off the screen.

2. Development Platform

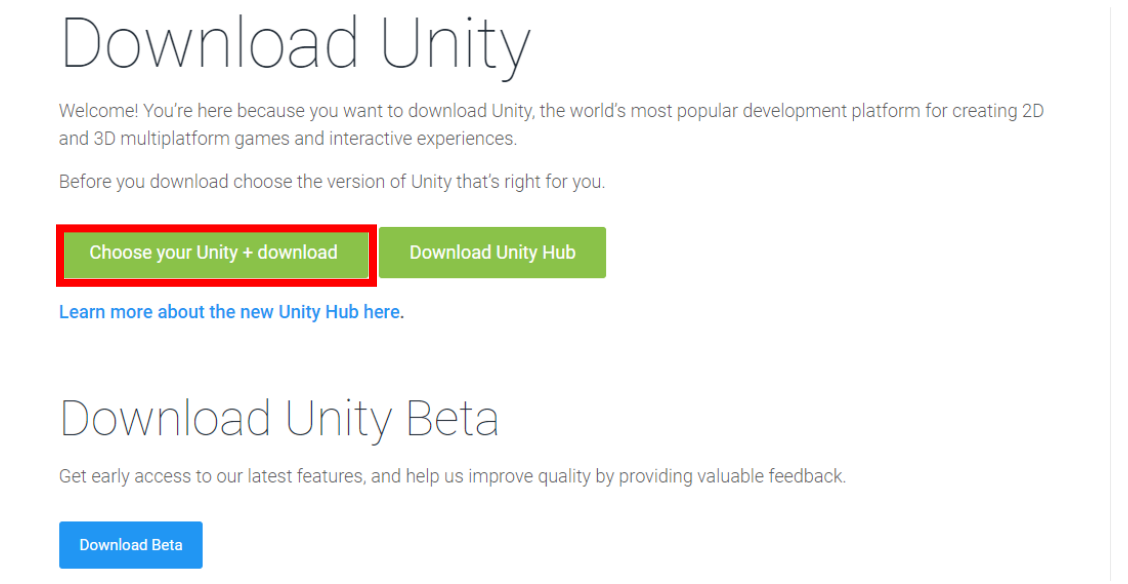
The Starchy Games development team used Unity version 2019.2.4f1 (Personal) to create Saguarophus.

Unity can be downloaded by following this link: https://unity3d.com/get-unity/download

You will be taken to the screen below. Click “Download Unity Hub”:

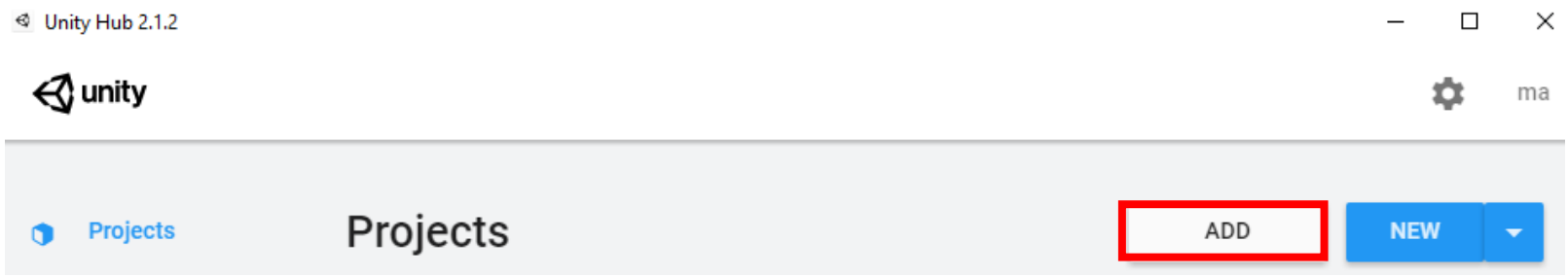


When you are finished Downloading Unity Hub, click “Choose your Unity + download”:

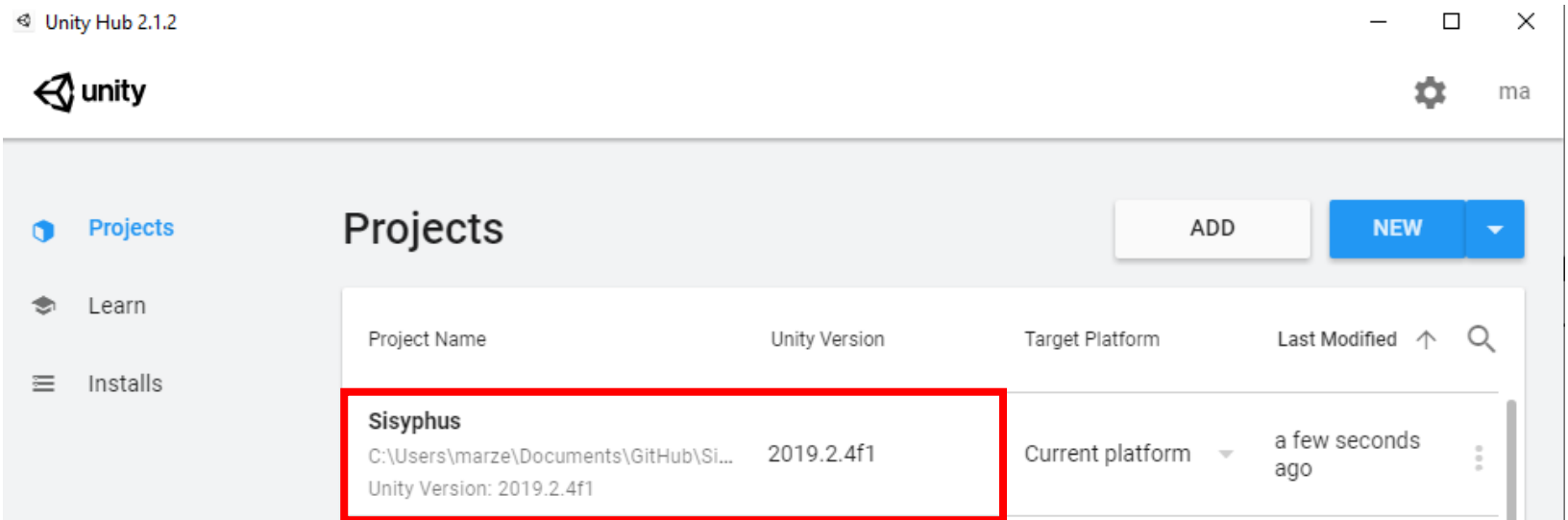


Make sure to review Unity's licensing agreements and select the version of Unity appropriate for your company. Once these are downloaded, open Unity Hub on your computer.

Click the "Add" button below.



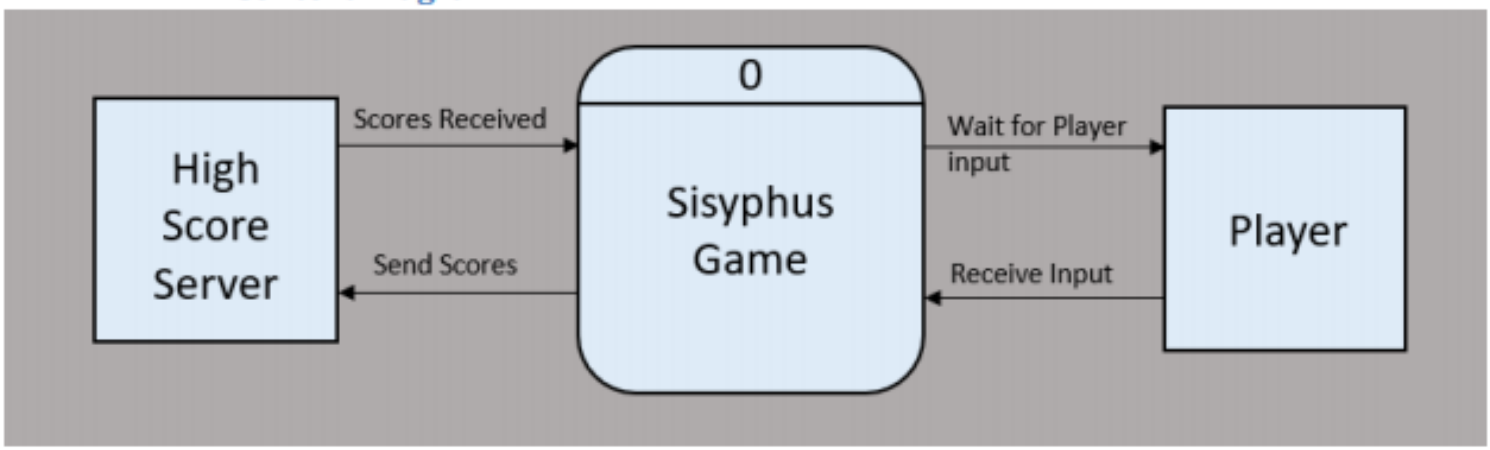
Navigate to where you have the files stored and click the on the file folder. This will import your project, with the same name as the folder where they are located. Click on the project name and it will open in Unity.



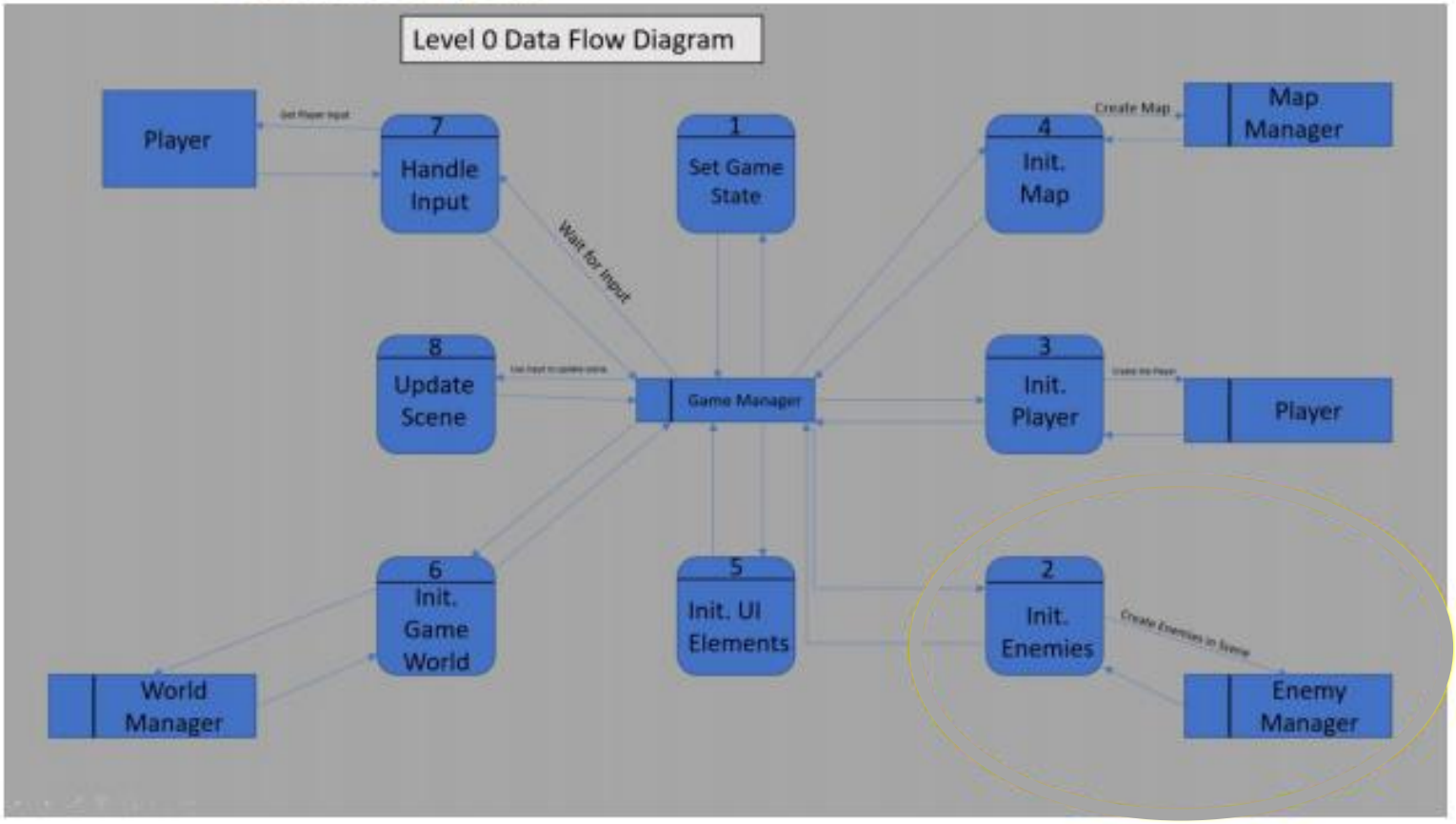
3. Code Organization

The code is organized based on the following context diagram and data flow diagram.

Context Diagram



Data Flow Diagrams



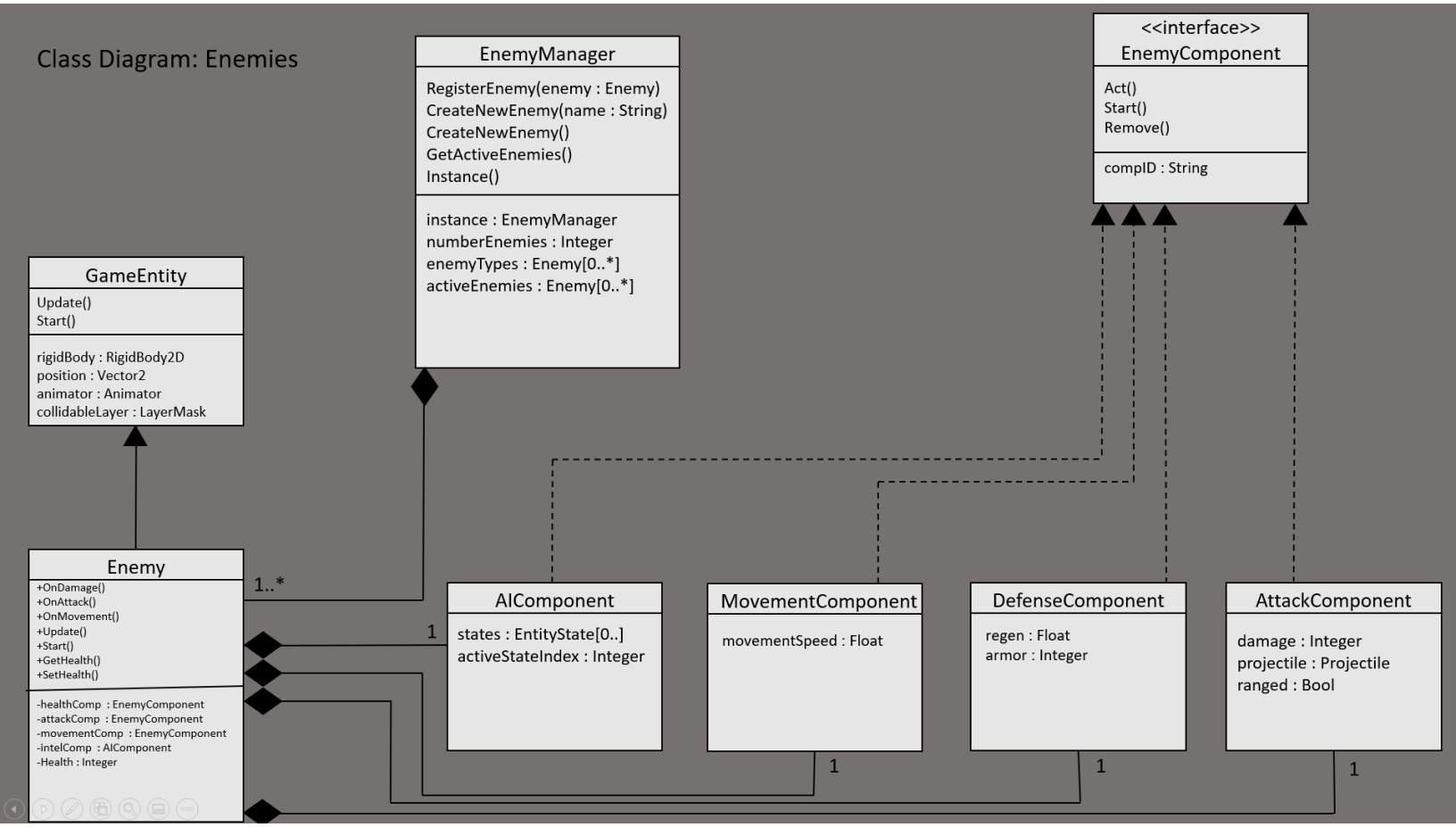
The main menu will load our single game scene (because the game is procedurally generated, all of the game's action takes place inside one scene). The main game scene includes the prefabs and managers for the main features: the player, enemies, powerups, UI elements, and world.

3.1 Code Walkthrough.

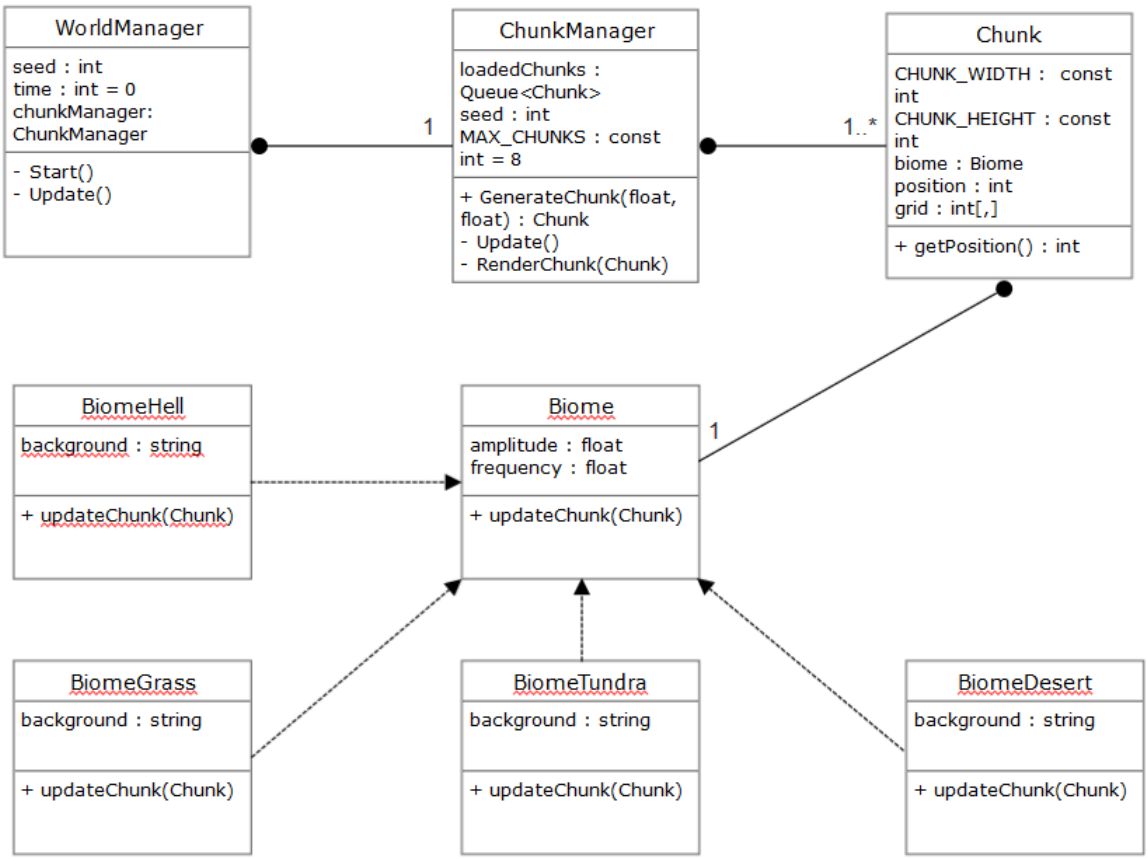
The Game runs as follows:

1. The Main Menu scene is loaded from the executable. From the main menu, you may choose the normal play mode or the Dr. BC play mode. Whichever option you pick, the corresponding (near-identical) scene will be loaded.
2. When the game scene is loaded, it will include several elements. These are:
    1. The Main Camera
    2. The Player prefab (this prefab manages the player controls and statistics. It acts as its own manager).
    3. The Event System
    4. The World. The World game object is also its own manager and generates “chunks” of world at a time as the player moves through the environment.
    5. The UI. The UI system manager controls the health bar and updates it with information from the player and powerups.
    6. The Power Up Manager. This manager is composed of several factory and action classes, and it creates powerups at intervals as well as handles their actions. It also increases the difficulty with regards to powerups as time goes on.
    7. The Enemy Spawner. The enemy spawner is a manager that creates and places different enemies throughout the game. The enemies are equipped with their own artificial intelligence allowing them to target the player
3. When the player’s health drops below zero, the game is over and the corresponding game over scene is loaded, with the option to play again or quit.

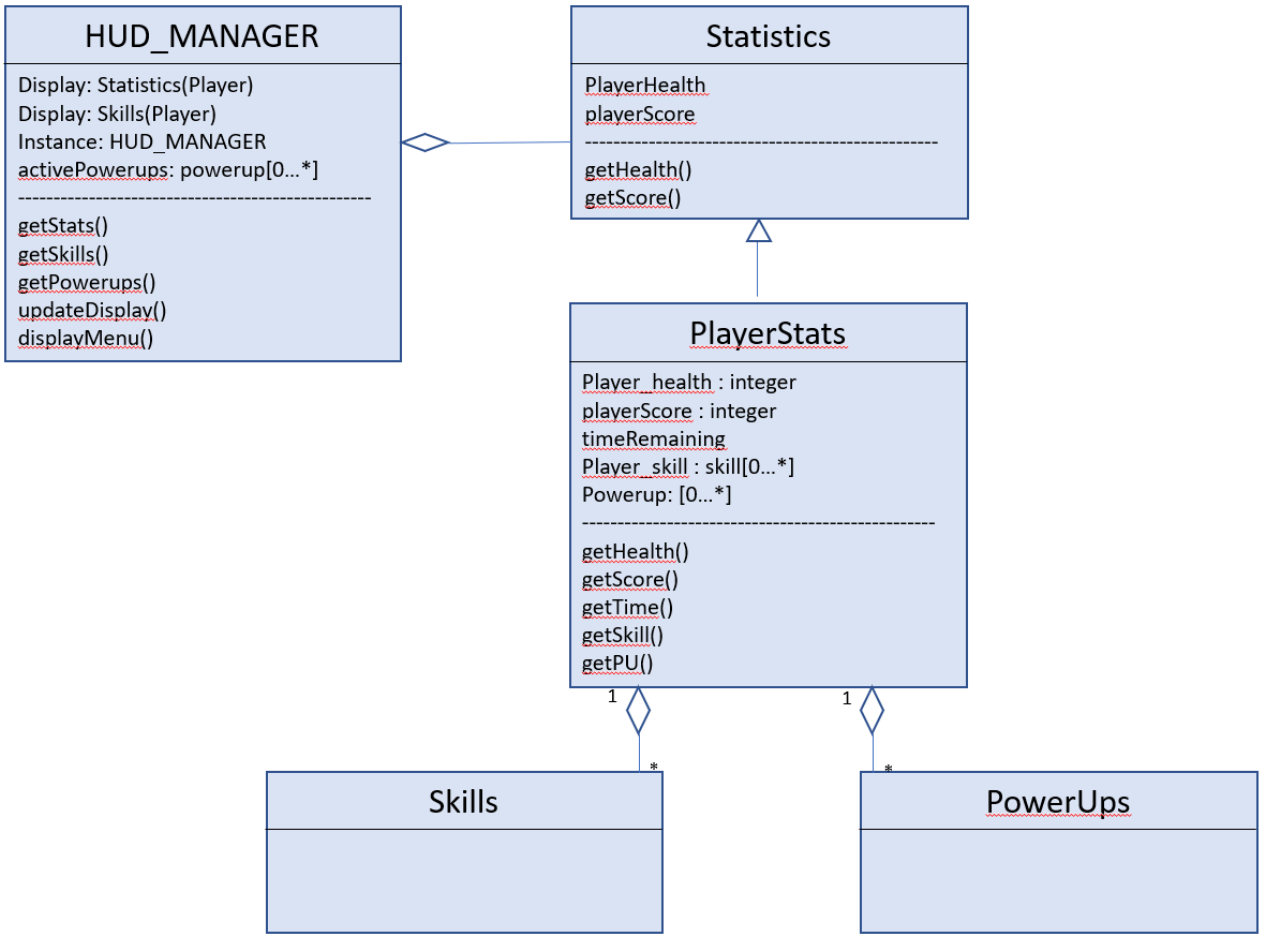
3.2 Enemy Class Diagram



3.3 World Class Diagram

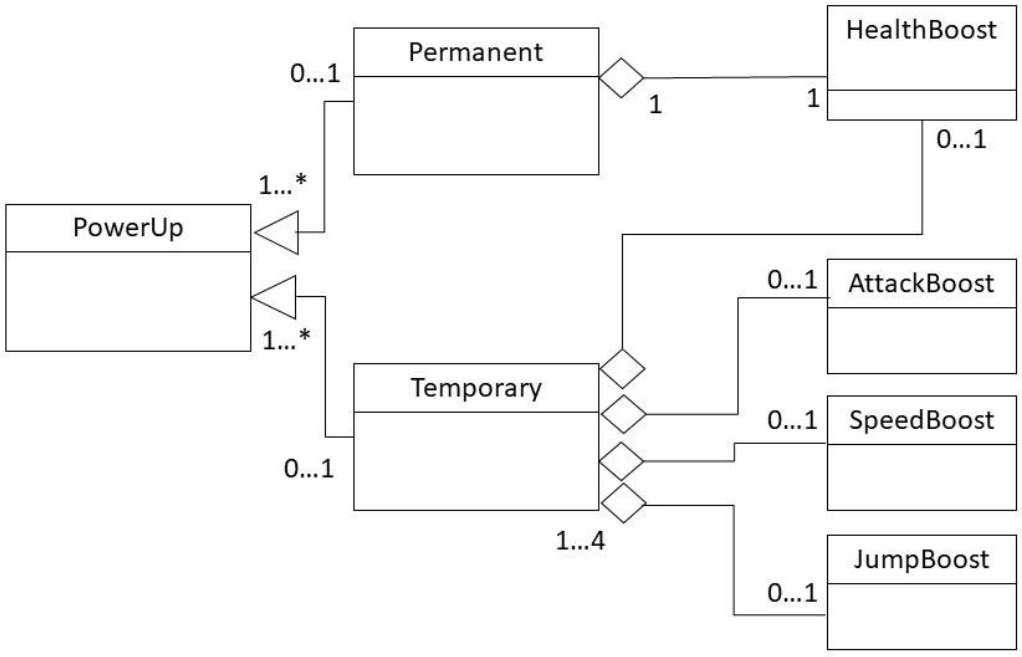


3.4 HUD Class Diagram



3.5 Power Up Class Diagram

Class Diagram for PowerUp Feature



4. Future Suggestions

Moving forward, there are some areas that can be improved or extended in Saguarophus:

1. The Power Ups are limited to 3 of the player statistics but could potentially be extended to include attack and defense variables.
2. Status bars could be added for player statistics beyond health.
3. The game is currently (and likely always going to be) “unwinnable”. However, it would be nice to have objectives the player can complete throughout the game.
4. The game menu screen in the future should probably display data such as the distance the player covered or the time the player spent in the game.
5. Dr. BC mode is currently “unlosable”—but also “unquittable”. A pause menu that allows a player to quit the game without dying would be a logical next step.
6. The addition of more sound in the game, as well as background music, would improve the game.
7. A background image that wasn’t simply a solid color would likely improve the look of the game.
8. The Power Ups get less useful the farther the player gets, but currently there is no concrete way to signaling to the player the extent of the change.