

Game Engine Project Planning

INFR 3110U – Game Engine Design & Implementation
Aaron Tran || 100825433

Group formation

I decided I would work on this project by myself without a group, mainly because I didn't think I would have been able to contribute much to a group due to my inexperience. Because of this, I worked on this project myself, and was responsible for all of the tasks needed to complete for the project.

Tasks included

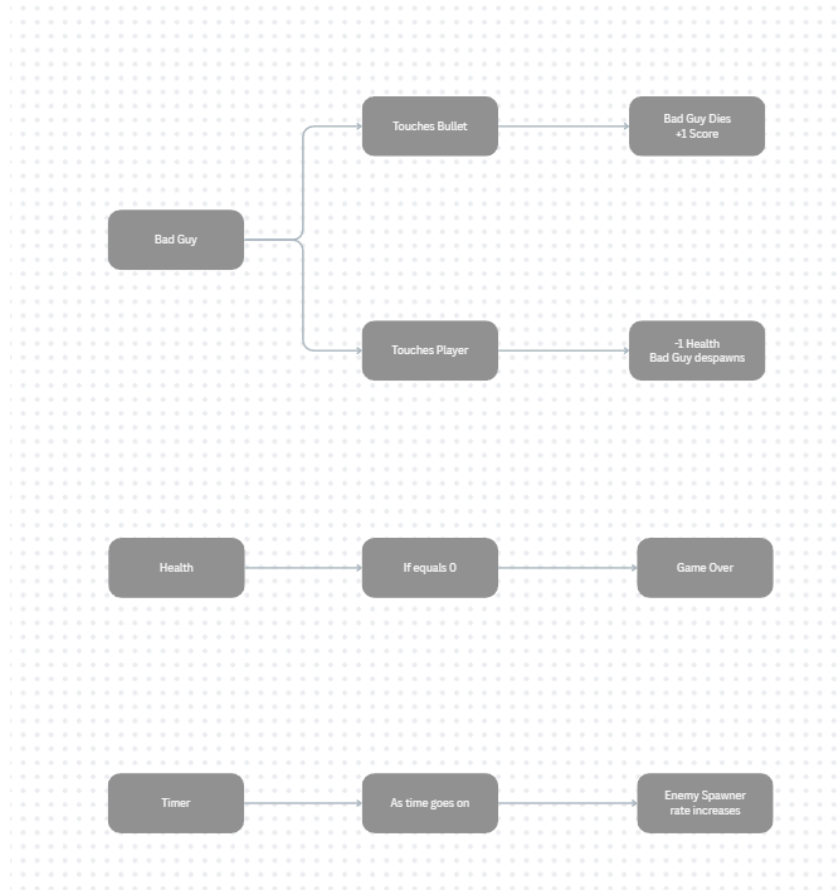
- Scripting and planning out the Design Pattern Implementation
 - Singleton
 - Factory
 - Command
- Programming in other gameplay features
- Creating Game Assets (Player and Enemy sprites)
- Creating Diagrams to explain design patterns

Game Information

This is a very simple game project meant to showcase very basic game features using the design patterns learned in class. The game itself is a top down shooter where the player must survive a slowly growing onslaught of enemies chasing you down.

Your goal is to survive for as long as you can, killing the enemies with your gun to rack up points while trying not to lose all your health.

To play, you use the WASD or Arrow keys to move, the mouse to aim, and Left Click to shoot out bullets. The enemies themselves randomly spawn within the box, and slowly spawn faster the longer you play. Once you die, you get a game over screen where you must restart the game if you want to play again.



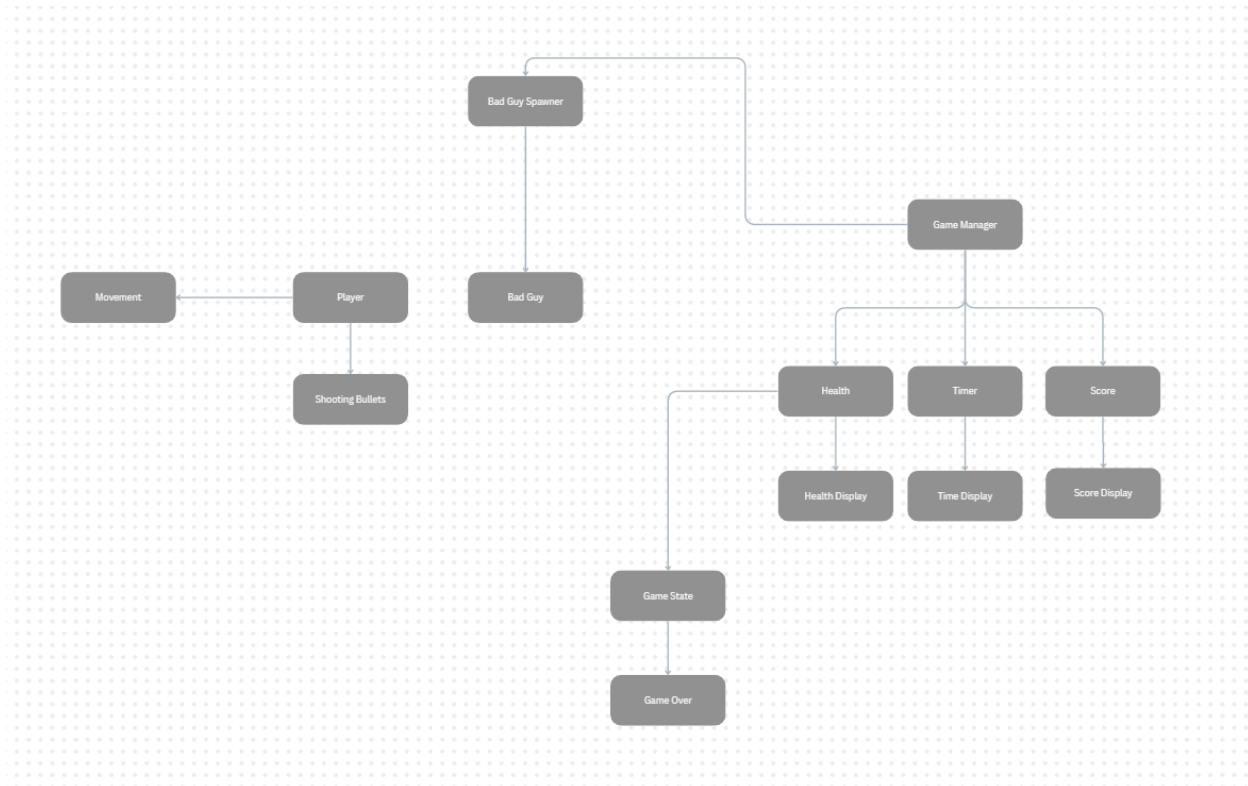
Game Logic Diagram

Simplified game logic shown through a flowchart

Singleton

The Singleton design pattern was used solely for the Game Manager of the project, where it keeps track of the game's time, health, scoring system, enemy spawning, and game state. It also handles the game's UI elements, making it solely responsible for keeping the game running.

If I could expand on this more, I would add an Audio manager to help manage potential sound effects and music for the game.



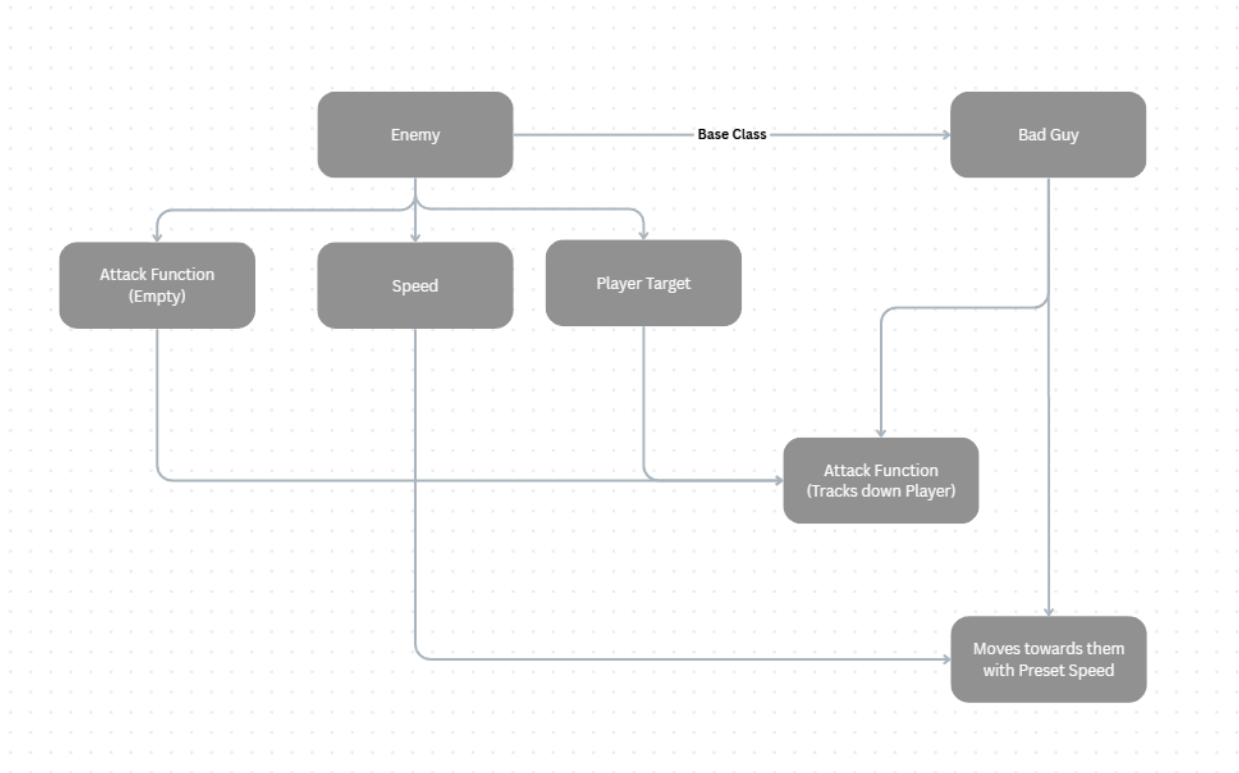
Game Manager Flow Chart

Shows what the Game Manager actually handles. Only thing it doesn't handle directly is the Player Movement and Shooting Mechanic

Factory

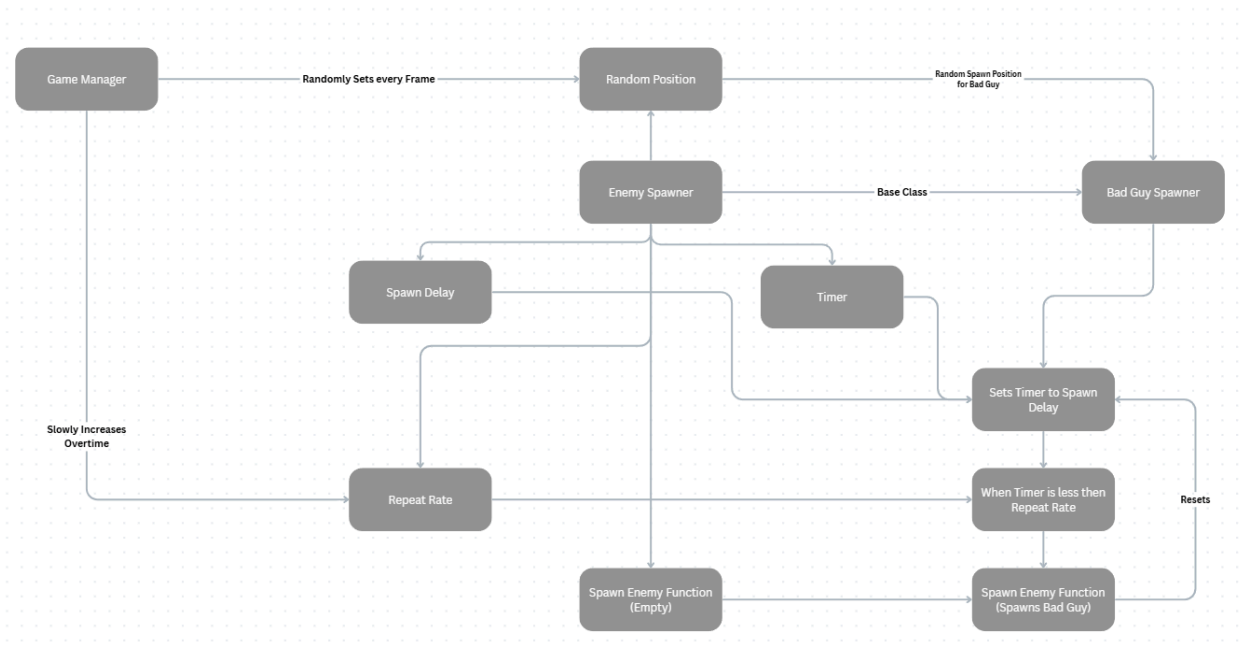
The main use of the Factory design pattern was to create an enemy spawner for the player to fight against. Enemies or Bad Guys will randomly spawn in the arena, slowly spawning faster and faster as time goes on.

If I could expand this further, I would add more varieties of enemies with their own unique behaviors. I would also implement power ups that the player could pick up. Things such as Hearts to heal the player, Coins to add more score, and maybe different Guns to give the player more variety in gameplay.



Enemy/Bad Guy Diagram

Shows the general logic and tools that the Bad Guy class inherits from their base class



Enemy Spawner/Bad Guy Spawner Diagram

Shows the logic and tools of the spawners and how they are used

Command

Sadly there is no Command design pattern implemented due to time. If I were able to implement it, the main use would be to create some sort of replay function to allow you to see the last few seconds of your run before losing the game.

I also would have liked adding customizable key bindings for the player to adjust for themselves if I had the time to do so. This would be accessed within a pause menu that the player themselves could click on.

Progress Plans

In the future as I continue to work on this, I will most likely finish up the remaining tasks that I wasn't able to finish for the course progression check in. I will also look into figuring out more detailed mechanics to make the game much more enjoyable rather than a simple prototype of a game. Finally, I just need to get more comfortable with the Design patterns and plan out the next steps to implement a Plugin for the future.

Plans include

- Multiple Levels
- Survive for a set amount of time
- Different enemies and power ups
- Implementing Visual and Auditory assets
- Basic Menu UI and Screens