**Stellar Tower Defense**

Documentation

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**Part 1.** *Game Tutorial*

This is a tower defense! Play the game by placing and upgrading towers on the map. Enemies will spawn at the edge of the map and advance towards the player base. Defeat all the enemies to receive credits (in-game currency) and progress further into the game. Use the credits to upgrade and place more towers. The game ends when the enemies manage to defeat you.

**Part 2.** *Concept*

The idea for this game came from trying to add something new to the idea of a tower defense. The map is not linear, it’s made from rotating circles with certain entry points. I used polar coordinates to crrate, move and allign everything in a circular pattern.

Seeing the rotating circular pattern around the center, made me instantly think about galaxies and space, so I chose a theme based around that. The map is made out of asteroids, while the enemies are spaceships. The towers are hidden between the asteroid fields, and the base is a space station.

**Part 3.** *Map*

The map is made out of 9 circular Asteroid Fields centered around the Base with radiuses increasing from 3 to 11. Each field rotates around the center depending on how far it is from it ( further circles rotate faster) . The mao is creating by creating “gaps” in the field, places where asteroids don’t spawn, that serve as entry points for the enemies. The further you progress, there are more gaps present in each field, meaning enemies have faster routes to your Base.

**Part 4.** *Entities*

There are 3 times of entities in Stellar Tower Defense: EnemyEntity, FriendlyEntity and PlayerEntity.

**Part 4.1** *EnemyEntity*

This is (as the name implies ) the instance for an Enemy type of Object. It is spawned on the adege of the map and follows an open path to the main base. It can only attack the main base after it finishes it’s journey. It inherits the stats for firerate and damage, as well as a few key features from the main Entity class like the abillity to shooy targets.

**Part 4.2** *FriendlyEntity*

This represents a tower instance. A tower is created with one of the buttons on the left side of the screen. It can only be placed on an asteroid belt, and when it’s placed it alligns and attaches with the belt. In additon to firerate and damage the towers have range that can be inscreased to attack enemies further away.

**Part 4.3** *PlayerEntity*

This is the player Singleton. It contains almost no simmilarities with the other two components. The only things they share are fireRate, damage, range and the abillity to shoot, as well as HitPoints.

**Part 5.** *Movement & Math*

**Part 6.** *Modularity*

I planed this game with the idea of modularity in mind. That means the main components of the game such as: level layout, enemy structure, enemy or tower types, upgrades, etc… can easily be created and upgraded. I chose a JSON file structure for the modularity of the game and I achieved it using 4 JSON files:

* *EnemyInformation.json*

Holds the information for every type of enemy. Here you can create a new type of enemy just by adjusting the numbers and name prefabs of this file.

* *LevelInformation.json*

Holds the information for the level structure, how many gaps per asteroid field, how many ememies and in what order will they appear. Tweaking with the numbers can balance one level or create another with just a few edits.

* *UpgradeInformation.json*

Holds the information for the avalabile upgrades for the base and for the towers. Simple modifications here can change the amount o e upgrade differs from the other.

* *PlayerInformation.json*

Finally this holds Information about a default player, one that just pressed new game. From this script you can edit the new player experience , and it serves as a base on top of which a player could save it’s progress in the future.

**Part 7.** *Plans for the future*

The game is just a prototype and nowhere near a publishing state, but even in development, the game’s ideea evolves with time. This being said I reserved the last chapter to talk about future prospects of the supposed game. One idea would be adding a set of “ super powers” for the player to use, to encourage more active gameplay. These powers could deal dmg, stun, slow or even scatter enemies along the belts. A few other things that could be improved are:

* Adding the abillity to save and continue a game.
* Adding a tutorial for new players
* Improve the balance of the game
* Improve on the pause button functionability
* Add the ability to change the number of asteroid fields per level from the modulsrity part
* Add shooting animations and different projectiles

Thank you for your time and I hope you enjoy the game!