**Space Invaders TD Project Proposal**

**Minimum Viable Product:**

My goal for the project by the due date is to have a basic functioning tower defense game with a player controled ship similar to that in the classic game Space Invaders. Enemies will spawn in waves and ettempt reach an exit point, causing you to lose lives if they reach it. If you lose all of your lives you lose the game. If you have lives remaining after the final game you win the game. The player will be able to place walls and upgrade them into towers that damage the enemies. Enemies will have to move around towers but will always move to the exit portal on the shortest path. If enemies die, the player will receive gold that can be used to buy more towers and upgrades. The player will also control a ship at the bottom of the screen much like space invaders that can move horizontally and can shoot at enemies in the maze to do further damage.

**Summary:**

The game is a hybrid of a classic build your maze tower defense game and a 2D shooter inspired by the classic game space invaders. In the game, enemies spawn at one position of the grid and move towards an exit point on the grid in the maze area. If an enemy reaches the exit point you lose a life. If you lose all of your lives you lose the game. The game takes place over a series of turns where new enemies spawn each turn. In between turns, the game pauses and the player can spend money earned from killing enemies to purchase towers and place them on the grid. Towers shoot at enemies during turns and form walls that enemies must move around, ultimately making their path to the exit longer. During each turn, the player also has control of a ship toward the bottom of the screen. The player can move the ship to left or right in the ship area and use the mouse to aim and fire equipped weapons into the maze to damage enemies. In between turns, the player can also spend money to upgrade towers and guns, purchase new guns, or change which guns are equipped. If the player defeats every wave of enemy with lives remaining they win the game.

**The Maze:**

The maze takes up the top two thirds of the screen and consists of rows and columns of evenly sized grid squares. The grid always has the same dimensions of 8 columns to every 3 rows, up to a maximum of 18 rows and 48 columns. A grid square can either be empty allowing enemies to walk through it, have a tower that enemies must walk around, or contain a start or end portal that determines start and end of the path.

**The Towers (Ideas so far):**

One tower can be placed on each free spot on the grid. When a tower is first placed, it does no damage and just acts as a wall. There are 4 different primary types of towers in the game that can be upgraded to.

Types: True Damage, Void Damage, Plasma Damage, Frost Damage.

A tower’s first upgrade is into one of these 4 types. From there, a tower can be upgraded into again into a secondary damage type.

Example: Void Damage primary, Frost Damage secondary.

Towers upgraded twice deal most of their damage as the primary type, but also deal some secondary damage of another type via a special effect. After the second upgrade, towers can be repeatedly upgraded to improve their damage.

**The Ship (Ideas so far):**

The ship can only move horizontally in its area under the maze portion of the screen. The mouse acts to move the crosshairs in order to aim its weapons. The ship starts with a basic machine gun that deals true damage (all guns deal damage based on the same 4 types as towers) that is mapped to left click. The ship can buy available upgrades to already owned weapons or new weapons in between turns and select which guns are equipped. Each turn, the ship can have up to 2 guns equipped at a time that are mapped to left click and right click. Each gun will be unique and serve a different play style in the game. Most weapons will fly over structures in the maze and only collide with enemies, effectively allowing the ship to shoot into the maze.

I’m thinking of letting there be 4 guns the player has unlocked when they first play the game (one of each main type). Another 5 or so types of other guns could then be unlocked by earning certain achievements in campaign mode of the game (Campaign section below).

Gun ideas:

True Damage Gun: Basic machine gun that has a high rate of fire and fast bullet speed.

Void Damage Gun: Slow moving projectile that moves in a straight line and does not collide with anything. Any enemy it is near has their health slowly drained.

Plasma Damage Gun: Projectile that does more damage the farther it goes.

Frost Damage Gun: Splash Damage projectile that slows any enemies hit but also slows any tower’s attack speed that is caught in the blast.

5 more!

**Enemies:**

Enemies spawn from portals and move toward the exit portal through the maze. They will cycle through animations as they move and have all sorts of fun sound effects and stuff.

Attributes:

Size ( 0 – 1 ) : Size percentage of a single grid tile.

Speed ( float ): Number of grid tiles moved per second.

Health ( float ) : self-explanatory.

Void Damage Scalar ( 0 – 200 ) : percent damage they take from Void attacks.

Plasma Damage Scalar ( 0 – 200 ) : percent damage they take from Plasma attacks.

Frost Damage Scalar ( 0 – 200 ) : percent damage they take from Frost attacks.

**GUI:**

Area at the bottom of the screen used for player menus and to present game information. Thinking of having it divided into 3 areas (middle, left, and right). Needs to support weapon upgrading, switching, and buying as well and tower selections and upgrades.

**Campaign:**

This part will have to happen much later. Planning on having the campaign take place in our solar system starting at the farthest planet. The ship is trying to stop the space invaders from reaching earth. Each level takes place somewhere in the solar system where each level gets closer and closer to earth. The campaign will have achievements that unlock new weapons and ship skins.

**Map Builder:**

Editor to create custom game maps that you can upload and share with others. Each map will have its own high score list that is online.