

Design Document

(Note: This document may not be representative of the final hand in. Everything is subject to change.)

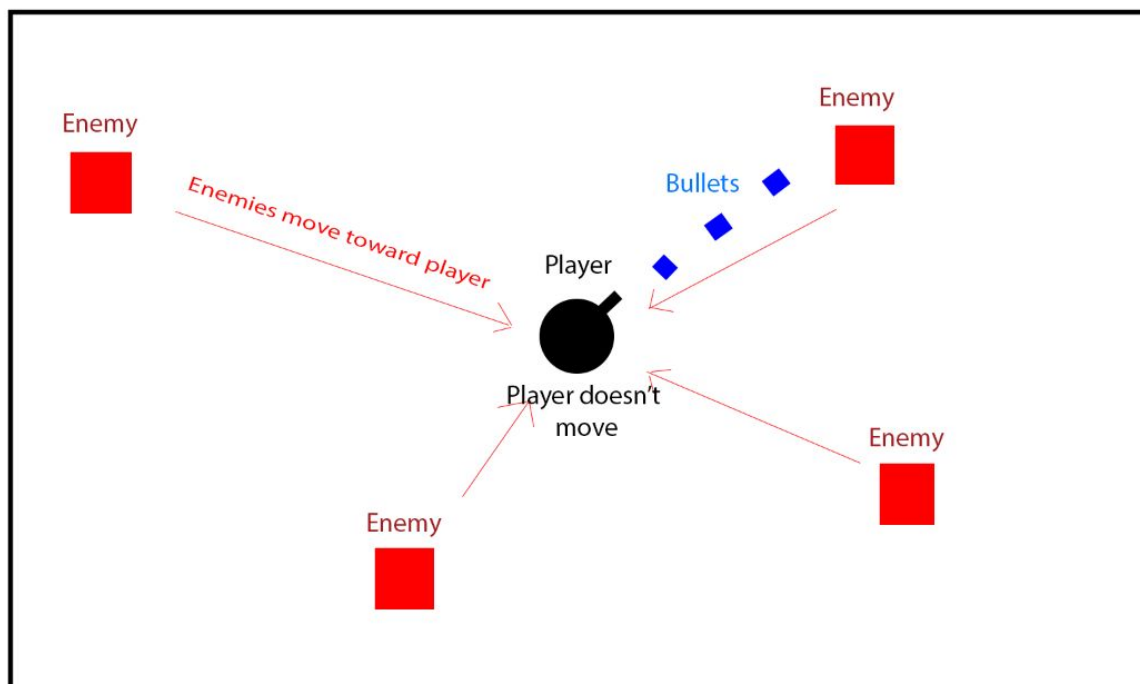
Concept:

The idea is to modify the tower defence game we have been developing in class. Instead of having enemies follow a pathway to an objective that that player needs to defend. The player will control one stationary tower in the middle of the screen and enemies will spawn in from the outside of the screen and move toward the player. The player controls the tower by shooting and aiming with the mouse. Firing projectiles at the incoming enemies.

Game rules:

- The player can shoot and aim using the mouse.
- When the player clicks a projectile will move towards the position of the mouse.
- There are 5 waves of enemies. The first wave has 20 enemies and each wave after that has more enemies in increments of 10.
- Enemies will appear anyplace on the edges of the screen one at a time and move towards the player.
- When the player projectiles hit an enemy, the enemy and the projectile will be removed.
- When an enemy reaches the player, the player will lose health and the enemy will be removed.
- If the player loses all their health, the game will restart.
- If the number of enemies in a wave have been removed. The next wave will begin.
- If the player removes the number of enemies in the final wave, the player will have won and the game will restart.

Drawing screenshot:



Updated Concept: (Updated on 2/8/20)

Reason for changes:

Changes have been made to the original idea due to the lack of control the player has over defending themselves from enemies. Being unable to move makes it difficult to implement multiple enemy types such as enemies that shoot back at the player or enemies with more health when the spawn rate is required to be fast enough to keep the player on their mental toes. Therefore the concept has been changed.

Enemies:

The enemies objective is still to make contact with the player enough times until they die, however the player is now able to move within the confines of a 'playspace'. 4 walls will surround the player allowing them to identify where they are allowed to move. Instead of enemies appearing anywhere along the edges of the screen, they will be funnelled into the arena from 4 different directions. This will prevent the player from a cheap death by being caught off guard if they are positioned toward the edges of the screen. Having 4 different spawn locations for enemies ensures the player knows where to expect enemies to be coming from but also makes sure the player is able to prevent being surrounded by just focusing one area enemies come from. Instead of enemies being removed from the game when they make contact with the player, they will now freeze in place for 1 second allowing the player to retreat. Once this second is over, they will return to their usual behavior of moving towards the player. Enemies also have health now instead of them just being one hit. While some of them only take one shot to kill, others will require 3 or 5 shots to be removed from the game.

Boss:

Allowing the player to move allows for more enemy types to be implemented including a boss fight, which will now be the only enemy the player has to defeat, once they make it to the final wave. The boss fight will not move towards the player like the other enemies but will instead fire projectiles in every direction. Forcing the player to be constantly moving but preventing them from getting too close to the boss and having an easy victory.

Waves and wave settings:

Breaks will also be given between waves giving the player a chance to reposition, check their score, what wave they are on, and just take a mental breather before they are attacked again. The player can skip waves manually if they want to start on a higher wave. The player can also manually reset the game at any time. The game won't reset if the player dies or defeats the boss on the 5th wave. Instead the player will be told whether they have won or lost. The player must reset the game manually if they want to replay.

Health:

Health can be earned by collecting health kits that will randomly spawn in the arena every few seconds. The player must move over them to collect them.

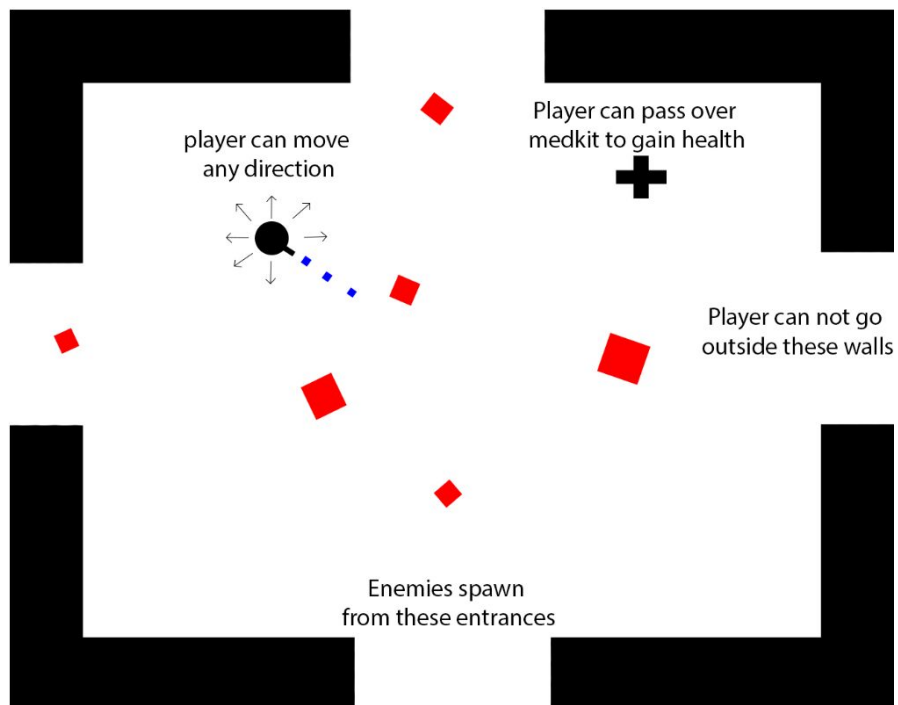
Difficulty settings:

Finally, difficulties will be added, allowing the player to adjust what enemy types they will receive on what wave. For example, hard difficulty gives the player all enemy types on the first wave, where easy difficulty gives the player only the easy enemy type on the first wave.

Updated Game Rules:

- The player can shoot and aim using the mouse.
- When the player clicks a projectile will move towards the position of the mouse.
- There are 5 waves of enemies. The first wave has 20 enemies. The following 3 waves after that have more enemies in increments of 10.
- Wave 5 has 1 enemy (boss).
- Enemies will appear to the left, right, top or bottom of the screen one at a time and move towards the player.
- When the player projectiles hit an enemy, the projectile will be removed and the enemy being hit will lose health.
- If an enemy runs out of health, they will be removed from the game.
- When an enemy reaches the player, the player will lose health. The enemy will remain stationary for a second before returning to it's follow state.
- If the player loses all their health, the game will end and the player will be shown a "game over" message.
- If the number of enemies in a wave have been removed. A wave break will begin and enemies will stop spawning for 5 seconds at which point the wave break will end.
- If the player depletes all of the bosses health, the player will have won and will be shown a "you win" message.
- If the player selects one of the difficulty setting buttons, the game will restart and the difficulty will change. This includes selecting the same difficulty that is currently selected.
- If the player selects the "next wave" button, the current wave the player is on will end. A wave break will begin and enemies won't spawn for 5 seconds at which point the wave break will end and the next wave will begin.
- If the player selects the "last wave" button, the current wave the player is on will end. A wave break will begin and enemies won't spawn for 5 seconds at which point the wave break will end and the previous wave will begin.
- If the player selects the "restart game" button, the webpage will be refreshed instantly.
- If the player moves over a health kit. The health kit will be removed and the player will gain health.

Drawing screenshot:



Updated Concept: (Updated on 5/8/20)

Health:

Only one change needed to be made to the previous changes. The health system for the player, specifically, the way in which they receive health. Having health kits that spawn every few seconds made it near impossible for the player to die, as they would easily be able to collect health kits and constantly replenish health, sometimes even moving through enemies, purposely losing health to recover it from a health kit. Increasing the time between health kits wasn't an efficient enough solution. Therefore the answer was to remove the healthkit from the game entirely and instead reward the player with 5 health every wave break.

Player:

The player also changes color from green to yellow to red depending on their current health. This allows the player to keep track of their health instead of having to take quick glances at the information on the side of the screen.

Updated Game Rules:

- The player can shoot and aim using the mouse.
- When the player clicks a projectile will move towards the position of the mouse.
- There are 5 waves of enemies. The first wave has 20 enemies. The following 3 waves after that have more enemies in increments of 10.
- Wave 5 has 1 enemy (boss).

- Enemies will appear to the left, right, top or bottom of the screen one at a time and move towards the player.
- When the player projectiles hit an enemy, the projectile will be removed and the enemy being hit will lose health.
- If an enemy runs out of health, they will be removed from the game.
- When an enemy reaches the player, the player will lose health. The enemy will remain stationary for a second before returning to it's follow state.
- If the player loses all their health, the game will end and the player will be shown a "game over" message.
- If the number of enemies in a wave have been removed. A wave break will begin and enemies will stop spawning for 5 seconds at which point the wave break will end. During this time the player will also receive 5 health.
- The player will change color depending on their health.
- If the player depletes all of the bosses health, the player will have won and will be shown a "you win" message.
- If the player selects one of the difficulty setting buttons, the game will restart and the difficulty will change. This includes selecting the same difficulty that is currently selected.
- If the player selects the "next wave" button, the current wave the player is on will end. A wave break will begin and enemies won't spawn for 5 seconds at which point the wave break will end and the next wave will begin.
- If the player selects the "last wave" button, the current wave the player is on will end. A wave break will begin and enemies won't spawn for 5 seconds at which point the wave break will end and the previous wave will begin.
- If the player selects the "restart game" button, the webpage will be refreshed instantly.

Final screenshot:

