Game Programming Project

(Monsters shall not pass) - to be discussed

Team

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Game description:

A tower-defense game with player avatar. Player avatar can move around the map and attack the approaching enemies. Defeated enemies drop set number of coins. Player can (seemingly enter the building mode without disrupting the flow of gameplay) enter "building mode" and place buildings (that cost coins) to provide the player additional firepower (turret buildings). (The player is equipped with a ranged and melee weapon which can be used to fend off the hordes of enemies). The hordes of monsters come in a variety of sizes, aggression, and durability. There are monsters that are fragile but nimble. Medium-sized, balanced monsters which can withstand decent punishment and advance at moderate speed. And humongous monsters which are moving at snail speed, take a lot of damage but can destroy player defensive structures.

Story

Defend your base against oncoming waves of enemies

Monsters

- Multiple types of monsters
    - Grunts – standard mobs
    - Tanks – high HP mob, lower running speed
    - Fast units – low HP mobs with fast running speed
    - Commander – high HP mob that reduces damage taken of nearby enemies

Player character

- Can move around
- Has a gun on his own
- His health = health of the base

Miscellaneous

- Player can use the shotgun and attack with melee weapon quickly after to cancel the need to reload and shoot with shotgun again
- Upon opening the game, a window is shown which allows the player to choose the difficulty settings
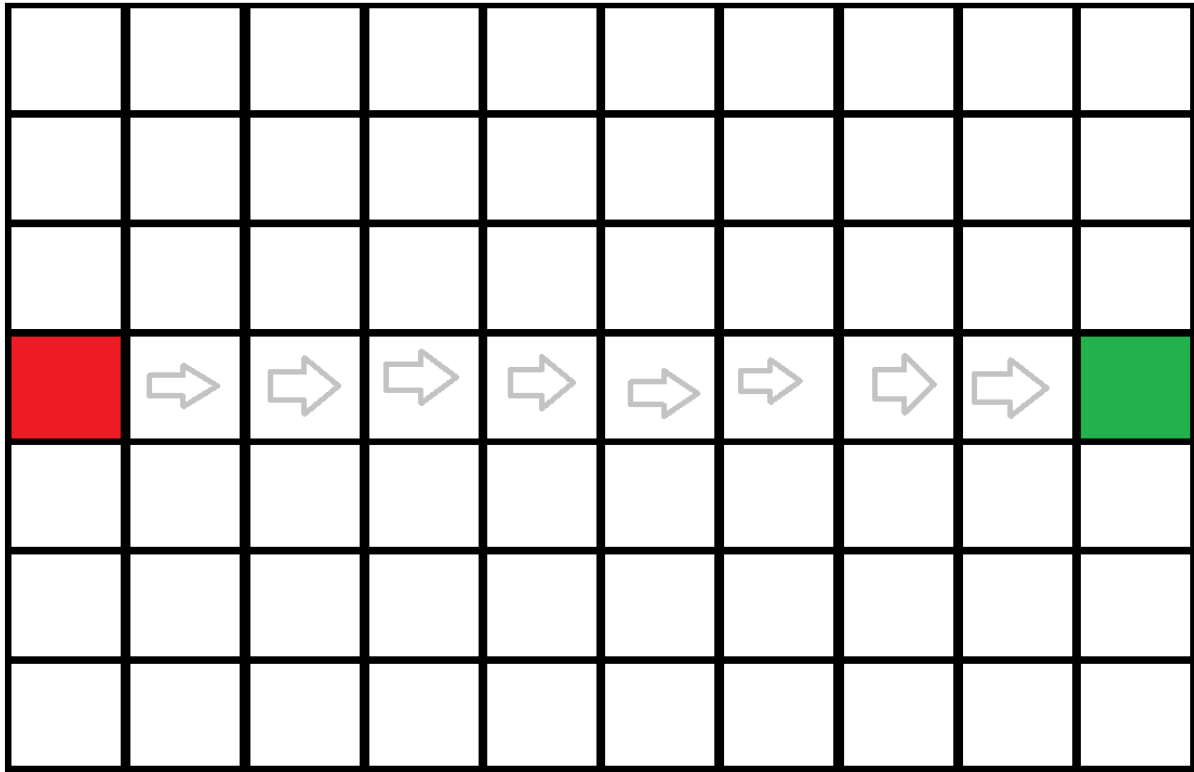
Difficulty parameters

- Increase the frequency interval of spawn monsters
- Increase the number of Nexus gates up to 3
- Reduce the amount of currency received
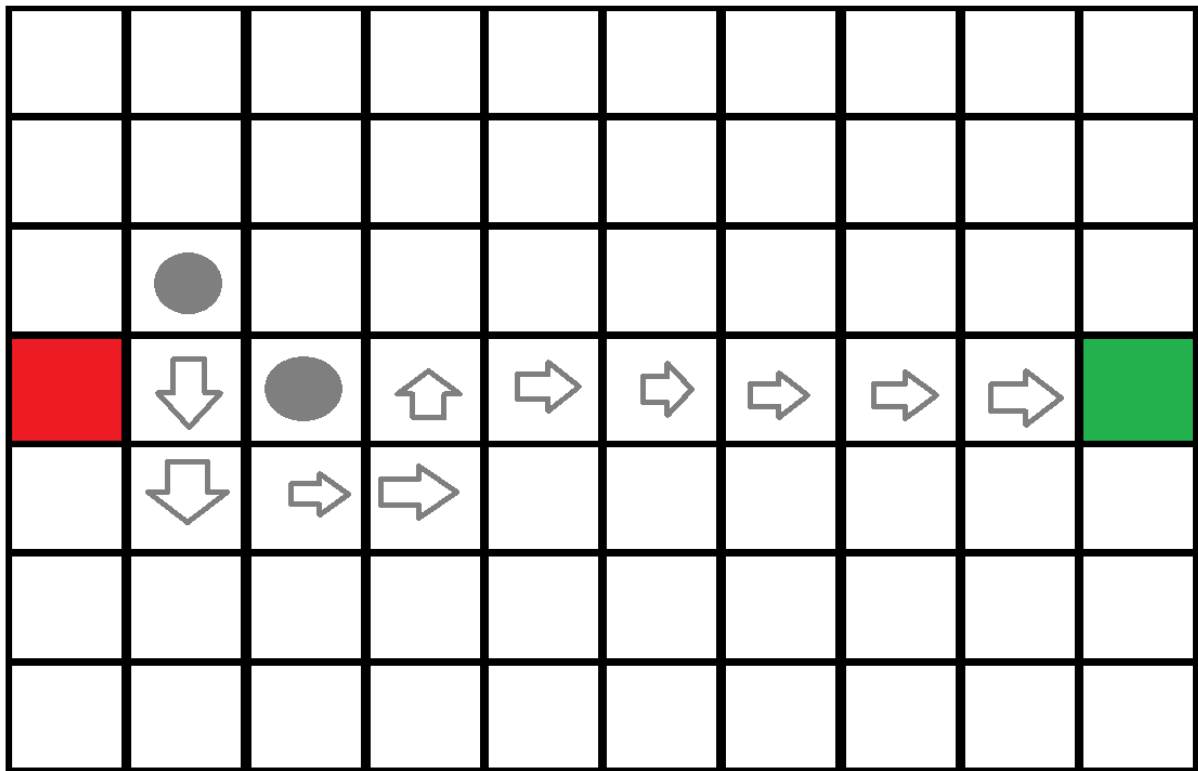- Smaller Nexus Gate HP pool

Implementation

Grid Layout

- Monster spawn point: red
- Monster destination point: green
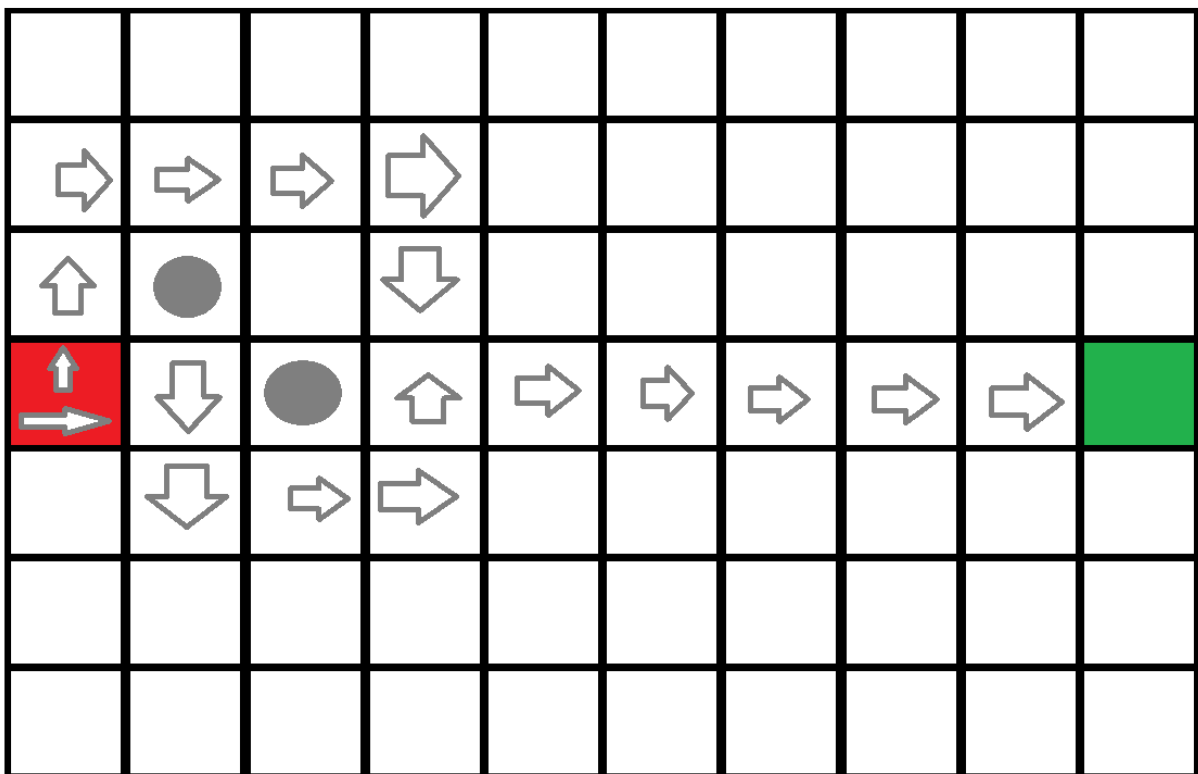- Monster wants to reach the destination using shortest path (arrows)

Problem

- Once player starts building (circles), path is changing

Problem

- Multiple paths to the destination

Solution

- Grid layout can be seen as a "graph" of it's center points
- Monster path finding using Breadth-First Search

Solution approach

- Whenever a building is to be spawned in a building mode, check if BFS yields results for each active monster and update their paths accordingly