Project 2
Design Document

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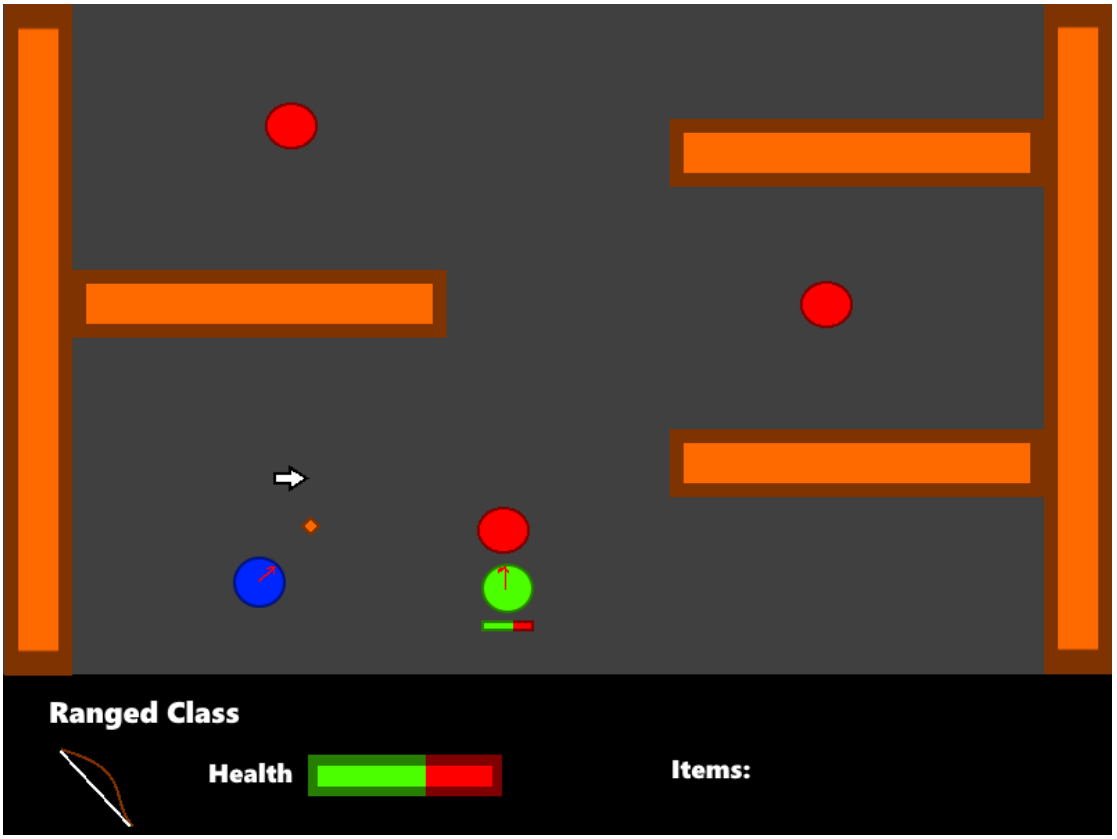
Basic Idea:

Project 2 will be a tile based dungeon crawler two player game. Both players will have the option to pick from a melee or a ranged character class. Each level will have a different map with scaled difficulty where both players must fight enemies to survive. Each map will be a scroll-as-you-move design, meaning as the players move, the map will move with them and adjust for what is on the screen. Each level's objective is for the players to survive and reach the end node(or tile) within the map. Enemies can be "destroyed" but may respawn depending on the difficulty of the level, whereas the players can take damage and be killed by the enemies. Our game will have a top down camera perspective, allowing the players to see each other and the map as it scrolls.

UI:



Above is a rough mock-up of what the player will see. This is from the blue players perspective. The blue is the player character, who has several red enemies closing in on them. The blue player faces towards the mouse cursor, and is firing a projectile in the direction of the cursor. Brown/orange walls are impassable and grey floors are passable. The green is the second player, whose current health can be seen as a health bar below him. The black zone is the UI section, where the player can see a title of what class they're playing, their current health and what items and powerups they currently have. As the blue player character moves around the screen, their current view of the level moves with them.

Controls:

1. [wasd] to move the player character around.
2. [mouse] to aim and rotate the character.
3. [l-click] to attack in the direction of the mouse cursor.

Entities:

- Player character: The characters controlled by the players. The goal is to keep each entity alive and to use their attacks to defeat enemies in order to survive until the end of the level is discovered. Each entity can not pass through designated walls in the map and can be killed by enemies leading to a game over state.
  - Melee Character: a character that can only attack enemies from adjacent tiles.
  - Ranged Character: A character that can only attack via a projectile, the projective can be tiled or velocity based and can travel horizontally or vertically
  - Enemies: Two enemies will be implemented in the base-line game:
  - Ranged Enemy: These enemies can attack the players from a distance, spawning projectile entities in the direction of the player which will damage them on contact.
  - Melee Enemy: These enemies can attack the player from a melee distance, playing an attack animation and doing damage to the player once in melee range.
- Projectiles: Projectiles can be spawned by players or ranged enemies and cannot pass through walls. If spawned by a player, they can collide with enemies, doing damage. If spawned by an enemy, they can collide with the players, doing damage.
- Walls: Impassable, immobile terrain.
- Health bar: A bar displaying the amount of health the character has left. One will be present on the UI for the player, and one below his partner on the map if applicable. Has no interaction with other objects.

Development Strategy (Milestones):

Milestone - Group Status Report: 11/15
Each milestone will roughly be a week-long sprint.

- Sam: Tile map(s) / Assets
- Brandon: Player controls / Assets
- Alex: Research tile map scrolling / Assets

Milestone One:
Map traversal

- Sam: Pathfinding
- Brandon: Building enemy and player classes
- Alex: Projectiles

Milestone Two:
Networking

- Sam: Feature implementation
- Brandon: Networking
- Alex: Feature implementation

Milestone Three:
Level Design

- Sam: Level design
- Brandon: Finalization of art/sound assets
- Alex: Feature implementation

High Bar List:

- ✧ Pickups and Items: Several pickups could be added to levels that will give the player a boost, such as a potion which heals, armor which blocks the next hit, or items that replenish special abilities.
- ✧ Class specific abilities: Different classes will have abilities unique to them. Such as the melee unit having dashes for increased mobility, or parrying for blocking damage due to being in harm's way more often. The ranged class could use abilities such as a spread shot which allows them to hit multiple enemies at once.
- ✧ Player Level System: Players will get the ability to increase their health, defense, speed, or damage output via points from leveling up through experience points gained from defeating enemies.
- ✧ Enemy diversity: More enemies included in the game such as tougher versions of standard enemies, enemies with unique area of effect attacks, enemies with variations of stats such as being slower but tankier, and a Boss enemy which the players can face at the end of all the levels.
- ✧ Improved art/sound assets: This would include an improved UI, animations for the player and enemies in the board, and sound/music to improve the game's presentation.
- ✧ Cooperative and competitive scoring: Two scoring systems would be implemented in the game. One which both players contribute to by defeating enemies, picking up items, and completing levels. The other each player will gain points towards an individual total, where each player could compete for the highest score.
- ✧ Stage Hazards: To improve level design, hazards for the players to avoid will be implemented. Traps which damage the player such as pit falls or spikes, and non-damaging traps such as terrain which slows the players movement or causes them to slide.
- ✧ Semi-Randomly Generated Levels: Instead of static level design, levels could be randomized by creating preset areas which will be randomly arranged to create a level. This along with randomized enemy spawns would increase replayability of the game.

Low Bar List:

- ✧ 2 player networked multiplayer: A client and server that allow two devices to connect and interact with each other.
- ✧ Traversable tile-based map: A tile based map that contains obstacles, interactable objects and moveable spaces.
- ✧ Asymmetry in player abilities: Players, depending on their class will have unique abilities that will be needed in order to progress through the most difficult stages.
- ✧ State based behavior: Enemies and player characters exhibit state based behavior, where their ID determines their behavior and abilities accessible to them.
- ✧ Health System: Each player, depending on their class will have a set amount of health that when depleted will result in the end of their game. When both players exhaust all of their health, the game will end as the loss condition will be met.
- ✧ Win conditions: Once either of the players reaches the end point of the level, the level is complete and both players move on to the next.
- ✧ Multiple levels with scaling difficulty: The game will consist of multiple levels which progress in difficulty to the player(s) in the order they appear.
- ✧ Constrained movement: Enemy and player movement will be confined to the edges of the map.
- ✧ Enemies: The game will contain at least two enemy types, one which will attack the player from melee distance, and one which will attack the player from a ranged distance.