Project Backlog

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Fathomless Caverns of Peril

1. Problem Statement

a) There are a plethora of roguelike, procedurally generated dungeon crawl games currently in existence. Our project will combine several uncommon features seldom found within this general genre of game. The main goal of our development is to fix undesired mechanics encountered in other roguelike games while supplying a competitive, score based leaderboard. These newly implemented gameplay features will yield a series of fun, engaging, and challenging single player levels. In our single player game, the player controls a character with 4 way movement across progressively more complex level maps (starting at a simple ground level, going deeper into a cave dungeon, and ending at the elaborate "Underworld"). The player picks up items along the way that help them defeat monsters with the ultimate task of traversing/beating all the maze-like cave levels and killing a final boss.

2. Background Information

a) Members of our group have a great interest in this general style of game. Unfortunately due to the rigid nature of the genre there are some rather institutionalized shortcomings a part of most games in this genre. We will be developing this game in agreement to some of our own personal preferences that we would like to see more within the genre and industry as a whole. Hopefully through our unique approach we will attract an audience of people, beginners or like minded veterans that will be able to benefit from our endeavors.

b) There are a substantial number of other games within the rogue-like genre. The most popular ones include Nethack, Angband, and Tales of Maj'Eyal. Some games that have a more similar approach to ours are even branded as "rouge-lites". These are less common games that take their own spin on different aspects of the traditional rogue-like games.

c) Other games in the genre have great replayability and expression of creativity throughout gameplay. Unfortunately they often have some fundamental mechanics that can make the overall experience less engaging. One of which is the incentivisation of what can be categorized as a boring, or lazy strategy. An example of one such strategy might be the abuse of free traversal between floors which allows for the hoarding of collected items. We will be removing the ability to return to previous floors which will hopefully reduce this issue. Another game mechanic that makes the experience potentially less engaging is the compartmentalization of fights due to the steady regeneration of health. This reduces every interaction into what would be a binary state where the player prepares by waiting to regenerate to full health, winning the bout, or loses due to being underprepared. This allows for the player to not make mindful decisions and simply rely on the fact that they will always be healed after a certain time threshold. Our game fixes this by not making health regenerate naturally. This ensures that the player will be constantly managing their own status and places emphasis on each interaction such that they always act with intent.

3. Requirements (Backlog)

Functional:

Game Engine:

1. As a user I would like the ability to play the game on a website.
2. As a user I would like the ability to play offline on my own device.
3. As a user I would like to have the ability to play the game on my mobile device.
4. As a guest I would like to be able to play the game with no save functionality.
5. As a user I would like the ability to log into my profile and save my game states.
6. As a user, I would like there to be a home screen with the title of the game and start game button.
7. As a user, I would like a pause game button, which brings me to the settings screen.
8. As a user, I would like there to be an end screen, for when a player dies and doesn't beat the game, also for when the player beats the game.
9. As a user, I would like to select a game difficulty that is persistent throughout the playthrough which alters the length (number of rooms) of each level, user and enemy statistics, number of enemies, and available items.
10. As a user I would like certain mobs to have the ability to destroy the terrain.
11. As a user I would like the ability to be able to view or examine terrain and enemy stats on mouse click.

Level Generation:

1. As a user, I would like there to be 22 different levels based on the story.
2. As a user, I would like a level map to be made up of multiple components including rooms, items, hallways, doors, decorations, and hazards like water, fire, rocks, and spikes
3. As a user, I would like each level to get more difficult, with more map complexity and monsters.
4. As a user, I would like each game playthrough to be unique, where the level maps and mob spawns are all procedurally generated.
5. As a user, I want to complete a level by finding the staircase(s) to the next level. Defeating all mobs or collecting all items is not necessary.
6. As a user, I want the procedurally generated level maps to make sense and be completable. Staircase to the next level is accessible because all rooms are connected.
7. As a user, I want both the player and the mobs to be confined to the logical boundaries of the map. Rooms, hallways, and decorations have edges that cannot be passed through or moved by the player.

Gameplay and Statistics:

1. As a user, I would like to have statistics including: health, attack, defense, level according to experience points, and special abilities that boost or diminish user related movement, speed, attack range, and enemy tracking.
2. As a user, I would like mobs to have many of the same statistics as the player to easily understand their capabilities.
3. As a user, I would like there to be the same bosses, some of which are optional depending on path selected, across each new game playthrough.

4. As a user, I would like to start out with maximum health and have the game end when I run out of health.
5. As a user, I would like a mob to die and leave a corpse behind when it runs out of health.
6. As a user, I would like the ability to pick up and use different items, including: potions which increase certain statistics temporarily and armor/gear that I can wear/use until it breaks.
7. As a user, I would like mobs to move around only when the player makes a move.
8. As a developer, I want to implement a user tracking algorithm.
9. As a user, I would like mobs to attack me through melee attacks/shooting/spells.
10. As a user, I would like there to be different tiers of mobs, the weakest tier seldom moves around and attacks the player, and the strongest tier tracks the user heavily and attacks often.
11. As a user, I would like there to be non-playable characters with optional dialogue. The NPCs will talk with the player by displaying text on the screen if the player chooses the option to talk.
12. As a user, I would like there to be an overarching narrative/story that is presented to the user through text (boxes and screens), so that I understand why I am going through the dungeon and defeating enemies.
13. As a user, I would like to have an overall score, that increase with defeating monsters, collecting items
14. As a user, I would like the score to be displayed that will be displayed within the game and on a competitive leaderboard

Audio/Visual:

1. As a user, I want a music track to play for each level.
2. As a user, I would like to add sound effects on actions, e.g., when the player fires at a mob, a firing sound would generate, when the player gets hit by a bullet a sound would generate etc.
3. As a user, I want the ability to change the volume settings of music and sound effects in the pause menu.
4. As a user, I would like there to be changes in the map textures based on the different level themes (caves, sewer, ziggurat, etc. have their own styles).
5. As a user, I would like to see animated sprites and textures.
6. As a user, I would like the ability to change textures, meaning edit player and mob sprites as well as the map components.

Non-Functional:

Response time:

1. The entire web page should load in less than 2 seconds.
2. The website should pass all google lighthouse development checks.
3. Player movements will be rendered on the client and validated on the server to reduce apparent latency.
4. Resources will be cached to minimize response time.
5. Low resolution textures will be used to minimize client overhead.
6. Codebase will be audited and thoroughly optimized to ensure optimal runtime.
7. Images will be in webp format.

8. Json map files will be reduced to remove unused entries.
9. Non essential resources will be loaded asynchronously.

Scalability:

1. The game engine should be able to display any sized map with any sized field of view.
2. New items, entities, and other game textures can be easily loaded in.
3. New map generation algorithms can be easily added.
4. New entity path finding algorithms can be easily added.

Usability:

1. There should be no client rendering errors or server exceptions.
2. Desktop users will be able to use the keyboard and mouse for inputs.
3. Mobile users will be able to tap on-screen buttons.
4. The game will fit all screen sizes.

Security:

1. Password data will be stored as a hash resultant of the most updated default cryptographic algorithm parameter.
2. SQL statements will all be properly bound to avoid the potential for injection.
3. All player inputs will be validated and executed by the server.
4. Any strictly offline version of the game will be unable to participate in the leaderboards.
5. A content security policy will be in place for client scripts.
6. Browser cookies will not be used.
7. Revocable sessions will be used to track UUIDs.

Etc.

1. As a user, I would like to have a consistent visual design philosophy for all buttons and menus.