Adventures in Operation Land

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Game Description Describe the game you plan to implement briefly. What is the idea? What are its key elements? What is its goal (or goals)? What are the educational components? What is the target audience? Are you planning to use Unity or Unreal? Please also write a few sentences for the following components:

- **What are you trying to teach through this game?**

  The objective of the game is to teach and improve math skills using the four main operations (+, -, /, and *). We will teach this by progressing the player through the game based on their performance in battles, which will be specified later. Briefly, the player will have to solve problems and answer math questions in order to progress and complete the game. By rewarding the player for answering questions, we hope they are incentivized to perform better and therefore improve their skills.

- **3D world and characters (e.g., will it be an open/closed environment? what type of objects/entities will it contain? Will it involve one or multiple human players (i.e., networking)? Will there be any AI characters?)**

  The game is a single-player game consisting of one human player wielding a sword and shield. The world will consist of five areas corresponding to the four operations and a final boss. Each area corresponding to an operation will contain smaller enemies to practice math skills and the main boss that the player can enter combat with. The boss in one area must be defeated in order to progress to the next area until the player reaches the final boss. The smaller enemies in these areas will randomly path around. The final boss area will simply be an arena containing the final boss. The environment will be a closed world with the gameplay being mostly directed and linear.

- **Game mechanics (e.g., what the player(s) will do? How does the environment change or what other entities do in response to the player"s actions?)**

  The game will start with some lore about how they need to defeat different bosses in the world to defeat the final boss to save someone. The player will start in the initial area where they will get to roam around the part of the world that they are in in order to explore and find mini bosses to fight. The player will walk around and as they kill the bosses, they will unlock new areas within the world. When any boss is within sight of the player, they will be able to engage the boss by drawing their sword. The player will then be given 10 different math problems that they must solve correctly. For every wrong answer, they lose a certain amount of health and if they get 3 questions wrong, then they 'die' and need to start over again. A death by a mini boss will result in a reset of that particular part of the world, but a death by the big boss will result in a hard reset overall. As each boss is defeated, the player

will be able to unlock new swords, new shields, and gain more health (can get more questions wrong).

- **Animation (e.g., will you use physics-based animation, rigid body simulation, hard-coded animations, keyframe animations, etc?)**

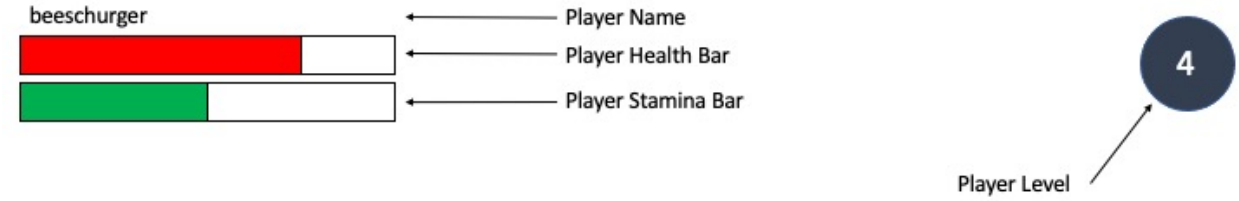
  We will be using a combination of keyframe and hard-coded animations to power our game. This includes various character models such as walk, run, attack, and block. These basic animations drive each character, both user and boss but we will need to develop different animations for the different events. For example, the user attacking and the boss blocking will have a different animation than if the user attacks and the boss is not blocking. The bosses will also have a *special move* which is unique to the boss but the player can acquire such special moves by defeating the boss. There will also be other environment-based animations to make the arenas more interesting and immersive such as fire.

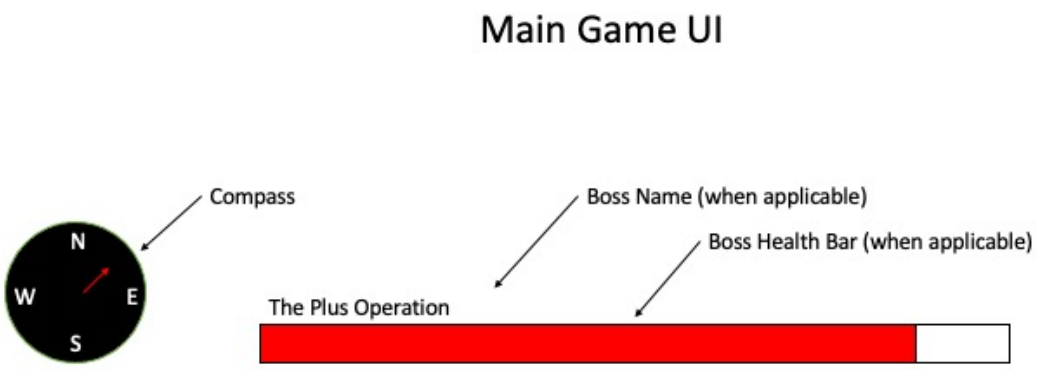
- **User interface and sound (will the game have any menus? what input devices/sensors do you plan to use? Will it work on a mobile phone? Will there be any sound effects?)**

  The game will include UI elements similar to any other RPG's, specifically elements such as a health bar, a stamina bar,, a level indicator, a compass, the bosses health bar when applicable, the player's chosen name, etc. We will also be a setting's menu to edit the various game settings and remap key bindings. Finally we will have a flow of menus for when the user enters and chooses a save/exits and saves their game.

  The game will only use a plain keyboard and mouse as input and will not be playable on mobile although a simple port to refresh the UI and touch controls could be developed for the game. A list of preliminary key bindings are listed below the attached UI.

  The game will include various sound effects, which include attacking, walking, running, blocking, and other sound effects that support a character walking and attacking. There will also be boss music to add to the ambiance of being in a boss arena.





Preliminary Key Bindings:

- W: Move Forward
- A: Move Left
- S: Move Down
- D: Move Right
- Space: Jump
- Left Click: Attack
- Right Click: Block
- Shift: Run
- Mouse: Orient
- P: Pause
- ESC: Resume

Split of the Work Provide a rough breakdown of the tasks each group member will focus on. You do not need to include this paragraph if you do not plan to work in groups.

We determined that the major components of the game can be summarized in eight points. These eight components are Characters, World Design, Combat, Player State, World State, UI, Story, and Music. The last two components will be more collaborative since the story requires cohesiveness beteween us as a group and music requires a more creative input. This leaves the first 6 components to be split amongst us evenly. This goes as such: Uday Patel will take World Design and World State, Gary Szekely will take Characters and Combat, and Navya Ravavarapu will take Player State and UI. This is subject to change as it is hard to gauge the exact workloads of each of these so we will that the work is split much more evenly as we develop the game.