Project Developer: Joshua Ramos

Project Description: Isaac

Isaac will be a recreation of the game “The Binding of Isaac”. Isaac will feature items, mobs, bosses, and graphics from the original game. Isaac will resemble a LITE version of the original game with a new map structure and a few new items to enhance the user’s experience.

Competitive Analysis:

During the Fall semester of 2015 at CMU, Xingyao Wei also decided to recreate the game *The Binding of Isaac* for their 15-122 term project. In their demo, they had three different types of mobs, one item, and only one floor for the user to traverse. The mobs in Xingyao’s game each had their own attack pattern, however, the patterns were not very complex. Xingyao also implemented the game’s original music playlist and sound effects.

In comparison to Xingyao’s project, I will also implement most of the game’s original features, such as an opening screen, different mob types, items, and different room types. In contrast, my take on *The Binding of Isaac* will have randomized map generation, multiple levels, and mob pathfinding.

Structural Plan:

My project will consist of many classes and functions. Some examples of the classes I will create in order to efficiently implement all of the objects within the original game are the Character, Mob, Item, Door, and Tear classes as well as the Pickup and Trinket subclasses (Subclasses of Item). The most important functions I will need for this project are generateMap(), which will randomly generate a new map that satisfies the current level’s floor-plan conditions, and hasCollided(), which will determine if two entities have collided. Most of the functions I will use will generate objects within a room, allow the user to traverse the floor, and advance throughout the game.

Algorithmic Plan:

The most algorithmically complex aspect of Isaac will be its randomized map generation. In order to generate never-before-seen maps that consist of random starting locations, random holes, and random rooms that are algorithmically placed in specific regions of the map, I will implement a recursive back-tracking algorithm. My plan to tackle this portion of Isaac will be to initially create a blank map, create holes at random, choose a starting location at random, and then randomly carve a path through the map.

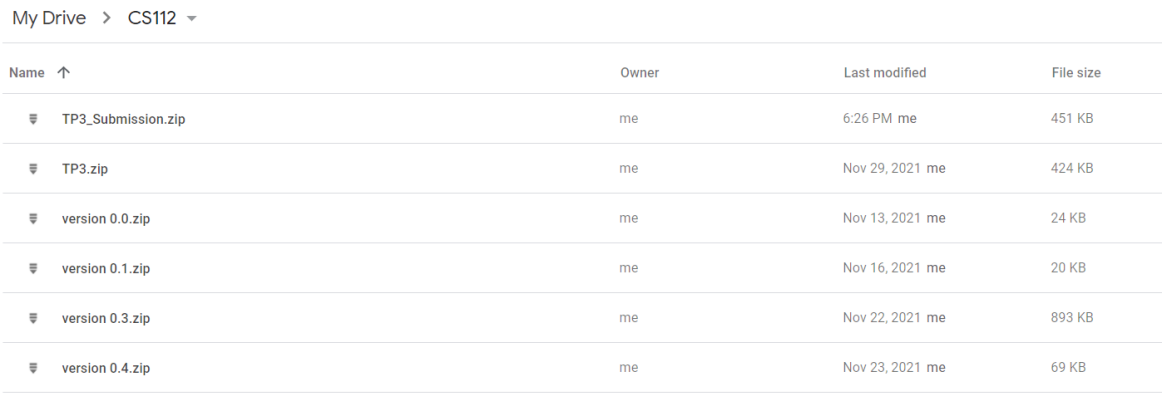
Timeline Plane:

- 11/18/2021
    - Have a randomly generated map
    - Have a room with doors fully generated

    - Have moveable characters on screen.
- 11/23/2021
    - Have a fully traverable game (room to room, floor to floor)
    - Have at least 2 types of mobs
    - Have mob pathfinding
    - Have an item room
    - Have at least 2 items
    - Have item pickups generating a random in each room
- 12/01/2021
    - Project Completion Deadline
    - Have a floor boss

Version Control Plan:

I am keeping track of my project's versions by uploading a zip file of each version to a google drive.



Module List:

I am not planning on using any modules until after MVP. Once my project reaches MVP, I plan on implementing sound-effects and background music.

TP2 Update:

My design plan has not changed since TP1.

Peer Feedback:

My peer feedback consisted of comments on the GUI, such as implementing health bars into the game, adjusting the position of aspects of the GUI, and increasing the size of the graph I used to implement a Breadth First Search searching algorithm. In reaction, I did not implement health bars, I did adjust aspects of my GUI position-wise, and I did not increase the size of my graph.

TP3 Update:

My design plan has changed as follows:

- I did not implement a Boss Mob into the game.
- I did not implement the Item subclasses ‘Trinket’ and ‘activeItem’.
- I did not implement sound effects/music into my game.