CS 4900
Week 2 Writeup
Group 1: Alan Bettis, Kenda Blair, Merritt Hancock, Ryan Trull

**Details**

Changelog:

1. Created cursor. Added cursor movement class. Wrote methods for cursor movement.
    a. ->Merritt, 1/29/20
2. Mapped ability to move player to cursor when spacebar is pressed.
    a. ->Merritt, 1/31/20
3. Made Rocky spaces untraversable
    a. ->Ryan, 1/31/20
4. Created a Grid Overlay over each terrain space.
    a. ->Ryan, 1/31/20
5. Created enemy and enemy movement.
    a. ->Merritt, 2/2/20
6. Worked on enemy movement code.
    a. ->Merritt, 2/3/20
7. Created replacement skybox image.
    a. ->Kenda 1/30/20
8. Started attempts to upload glTF files and implement orbit control. Fixed some problems with camera controls that came up during refactoring
    a. ->Kenda 2/1/20
9. Further research into glTF files and OrbitControl and errors that came up during attempts to implement them. Resized images to fix power of 2 warnings
    a. ->Kenda 2/2/20
10. Looked into 3D model programmatic modification in Three JS. After coming up empty, created simple textureless glTF 3D model in Blender to display instead of our tile-based system.
    a. ->Alan 2/2/20
11. Refactored movement methods across the codebase to use one method with a switch statement instead of a different method for each direction to move.
    a. -> Alan 2/2/20
12. Learned from Wallace that our three.js file version was incompatible with our glTF model importer. Fixed glTF importing.
    a. ->Alan 2/3/20
13. Implemented Gap spaces which cause player to fall through
    a. ->Ryan, 2/3/20
14. Implemented Limitations of the movement cursor, allowing for moves only within specified range. Default player range is 1 space in any direction.
    a. ->Ryan, 2/3/20

15. Implemented cursor color changing based on valid move spaces within the range. Green: Valid Move Yellow:Invalid Move
    a. ->Ryan, 2/3/20
16. Re-enabled old camera controls temporarily since OrbitControls were not implemented.
    a. ->Alan 2/4/20
17. Added heightmap array that contains height of each tile in the grid. Adjusted grid overlay to display at heights according to the heightmap.
18. Cursor now displays above player at all times and moves up to match terrain height.
    a. -> Alan 2/4/20
19. Cursor now changes colors appropriately according to movement ranges and traversability of terrain.
    a. -> Alan 2/4/20
20. OrbitControl implemented
    a. ->Kenda 2/4/20

**Decisions**

**Models over Grid**

Allowed us to have 3d terrain for our levels while still using the grid matrix to determine traversability of the terrain.

**Implemented a Grid Overlay**

Our game board now displays a grid over each tile for a cleaner look and better visual of moments and traversal.

**Added Cursor**

We implemented a cursor as a method of controlling the player and showing available traversable terrain. The cursor changes color to indicate which terrain is traversable.
Limit player movement to n spaces

**Change Cursor color over traversable**

When the cursor is within our player range (default 1), Cursor will highlight green to signify a valid move. When cursor is outside of range or hovers over an untraversable wall, highlights yellow to signify an invalid move.

**Switch to Orbit Controls**

The orbit control gave us better optimization when rendering and the option for mouse input gives more flexibility than keyboard inputs. Additionally, rotation is no longer locked onto a specific point.

**Resized images to power of 2**

This helped prevent errors and increased speed of rendering.

**What We Learned**

We learned that the older version of the THREE.js file does not support OrbitControls or glTF. Additionally, we learned how to make models in blender. We also learned the importance of not having spaghetti code when using libraries.