HIGHLIGTED AREA ARE SPECIFIC TO THE FINAL PROJECT

1. What is the problem?

For assignment 4:

This assignment is about having the user navigate a maze. There will be obstacles, such as walls and doors, a ghost that will move around at will, and keys to help the player, controlled by the user, get past doors and cherries to prevent the player from getting sent back to the start by the ghost.

For final assignment:

This assignment is asking us to modify our previous assignment and include some new features. One of the new features is the new movement of the ghost. Instead of only moving in two direcitons, it can now move in four. Additionally, it can go through objects such as walls, doors,etc. The other change is how the floor the player is on is printed. Now, each floor is printed so that at the beginning, the user can only see a 10x10 display at the beginning, and as the user goes to new places on each floor, more and more of that floor is shown.

2. Plan: See attached

3. See implementation files

4. Reflection and testing:

For assignment 4:

This assignment seemed fairly simple and straight-forward. There wasn’t much going on. I was able to look at previous labs to see how to read the maps from the text files. Mostly, it was about how the player interacted with the map and the ghost. The instructions didn’t specify how exactly the ghost could move. For example, it did not say whether it had to move only 1 space each turn or as many as it could; it only said it can move in one direction in the main hall. I decided to make things more interesting by having the ghost be able to move/teleport a distance of up to 5 spaces right or left each turn. I also made it so that the ladder takes you to the spot you were before you entered the ladder if you decided to go back up/down, thus keeping things consistent. Everything works as it did in the assignment description; all the rules are being followed. Below are some of the testing:

For final assignment:

During the demo for assignment 4, I realized that when the user is inputting the direction for the movement of the player, I will missing the code that allows the user to enter things like “w4.” I did not update the new version to take this in because it would cause drastic changes to my code and would require an entirely new design to the major functions I already have in my code, which would take much too long and would require a lot of new code and lot of removal of pre-existing code. Instead, the user can go multiple spaces at once by repeating the key. For example, to go up 4 spaces, the user can enter “wwww”. One important thing about this program is that to go up/down stairs, you have to be 1 space AWAY from the stairs, i.e. you cannot be directly on the stairs when you hit u or z. Also, as a side note, the player’s initial position is (0,15).

To design the improvements to the code, I did two separate things. The first, and easier, thing to do was to change how the map was displayed. To do this, I took the advice given by the assignment and created a second map, one that actually gets printed. While the first has all the obstacles and things in it, the first is the one that takes a certain portion of it to print. The way it works is that each time the player moves, the 10x10 space (focused around the player) gets copied from the first map to the second. Afterwards, the second map gets printed. Then second thing I did was alter the ghost’s movement. The ghost moves by a series of steps. First a random number between 1 and 4 is drawn. This determines which way the ghost will move (up, down, right, left). It then does a boundary check if the ghost is on the map, then checks if there are any obstacles for the ghost to circumnavigate around, and finally moves the ghost. This is how I changed the previous assignment to account for the new modifications.

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| What is tested | Expected | What occurred | Correct? |
| Player picks up cherry | Invincibility set to 20 | Invincibility set to 20 | y |
| Player picks up key | Num key goes up by 1 | Num key goes up by 1 | y |
| Player picks up 4 keys | Only holds 3 keys | Only holds 3 keys | y |
| Player hits ghost without cherry | Player sent to start, ghost goes away | Player sent to start, ghost disappears | y |
| Player hits ghost with invincibility | Ghost goes away | Ghost goes away | y |
| Player goes up ladder | Player ends up at the ladder on next floor | Player ends up at the ladder on next floor | y |
| Player goes down ladder | Player ends up at the last spot he was at in the previous level | Player ends up at the last spot he was at in the previous level | y |
| Player reaches end | Program ends | Program ends | y |
| Player hits wall | nothing | nothing | y |
| Player hits door without key | nothing | nothing | y |
| Player hits door with key | Door opens, num key goes down | Door opens, num key goes down | y |
| Ghost moves in empty space | Ghost moves randomly in 4 direction without going past map | Ghost moves randomly in 4 direction without going past map | y |
| Ghost going past obstacles | Ghost jumps over obstacles | Ghost jumps over obstacles | y |
| Player moves across map | More spaces get revealed | More spaces get revealed | y |
| Ghost within 5 spaces of player | Ghost follows player | Ghost follows player |  |