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Assignment: Final Project

**Design**

1. Base on assignment 4, the main changes of this project are the ghost and the display of the map;
2. Ghost moves randomly, there are 4 directions, so I will use “rand() & 4” to randomly get 5 different numbers(0~4), each number represent a direction, the extra one will be saved to default;
3. Base on my assignment 4 design, the ghost will be not moving if its next step is not a space, to change to ignore walls, I delete this statement and make it be able to go through the entire map, and if it’s moving on an object(wall, door, cherry, etc.), the item will be saved previously and be printed out again after the ghost leave;
4. To detect the distance between the ghost and player (within 5 steps), since I have a tracker to return the current position of both ghost and player (pX, pY, gX, gY), I compare the difference between their position by using “abs” function (absolute value), after getting the difference between pX and gX, pY and gY, such “abs(gX-pX) + abs(gY-pY) <= 5” , then if the sum is less or equal to 5, then player will be”seen” by the ghost.
5. If the ghost checked that it is true (within its 5 steps distance), its moving function will be changed, and ghost’s moving direction will be depends on the difference between pX and gX, pY and gY, such if gX-pX>0 -> go up; gX-pX<0 -> go down;

gY-pY>0 -> go left; gY-pY<0 -> go right;

PS: in order to make this alter testable, I set that if the ghost detects out the player is within its 5 steps, then its moving distance is 1 step only for each round. Otherwise (player not in the range), it will still be like in the assignment4, which its moving distance is random (<=5).

1. In order to print out the certain area for map, I create another array (called darkmap) which also have [20][30] size, and a function to indicate that an area within player’s 5 steps(pX+5), (pX-5), (pY+5), (pY-5), then within this area, the function copies this range in my tile array to darkmap. Then use a checker to indicate that which area has been reveled, finally the current darkmap will be printed.

**Test Plan**

Base on the completion of assignment 4, there are 2 main things to test for this project:

1. Direction of the ghost when it doesn’t meet the player within its 5 spaces; and as well as is it able to change direction when it met the player; the test plan for this will just simply move around and find the ghost. To test if it is within 5 spaces, it should be the sum of x-direction + y-direction. After the player is within its 5 spaces, see if it is following me.
2. To test the map revealing, first I will put ‘/’ into the darkmap which let it be distinguishable with the current master map. Then I will test the change of the map by player’s moving, which the darkmap will be revealed by the moving of player’s position

**Test Result**

1. For ghost, it can successfully detect if the player is within its 5 steps, if is, it will follow after the player until player leave away 5 steps from it; and in normally, it will keep wandering around randomly.
2. For the map, it reveal the space within 5 step, but it’s only 4 step count from the player, and it should 5. And after getting to the next floor, it will be dark again and is an expected result.

**Self-Reflection**

**Unfixed bugs:**

If the player has cherries, which means it can kill the ghost, but if the ghost is in a wall or door or else which is not space, and since the player move to the ghost, the original item will be disappeared with the ghost.

My code seems would take a lot of stack which some of the codes can be written in a better and simpler way. So when dealing with the detail, it’s not completed perfect, but in overall, the codes meets the requirement