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2D Turn Based Game Project

**Introduction**

This 2D turn based game was made using c++ and Microsoft Visual Studio. The game was created to showcase the Dijkstra Shortest-Path algorithm for graphs. I implemented four classes to use in creating the game. I created a Map class using a matrix, a priority queue class using a min heap, a graph class using an adjacency list, and a Character class.

The game is currently in finished state. The game compiles, runs, and it is possible to test the main game loop. However, there was a major bug in my Dijkstra algorithm that I fixed. I found out that the problem originated in my decreaseKey() and pop() methods in my priority queue class. I just needed to make those two methods re-heapify correctly.

**Gameplay**

This is a 2D turn based game that runs using a game loop. The main objective of the game is to not be caught by the enemies. If you are caught the game and map will reset.

The game starts with the player choosing a map to play on. Then the game plays out in a sequence of turns. After selecting the map, the game will build a 2D map that correspond with the map the player selected. An adjacency list will be built for the map, and then the characters for the game will be created.

The turn order proceeds in a sequential manner. The current state of the map will be displayed on the console. Then the character info for the players and enemies will be displayed. (Info such as current status, name, and current location will be shown). The enemies will perform a vision check to see if they can see the player (Their line of sight is 4-directional; up, left, down, and right). The player will have the first turn, being able to move freely. After this, all 3 enemies will perform a movement turn based on their current status. Then the game will check if the player has been caught by the enemies. Finally, a check will be made to see if the player has quit the game. The game will restart if the player has been caught. The game loop will run until player has chosen to quit the game.

The controls for the game are the following. Use WASD to move your character (W is up, A is left, S is down, and D is right). Press and enter “space” to skip your turn allowing enemies to move. Pres and enter “q” to quit the game, this will terminate the game loop.