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Assignment 4 - Pathfinding
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GameApp / Game

In Game the escape function was taken out of main and put into inputmanager along with the mouse click buttons from GameApp. The GameApp defaults into depth first search, but when the user presses the A or D key, it will switch to either A* or Dijkstra. The GameApp receives messages from the input manager to tell it what to switch to using a switch statement.

Dijkstra

Dijkstra is similar to how it is within the textbook with some modifications. The NodeRecord's connection was replaced with a NodeRecord because when the program tried to rebuild the steps backwards to build the path, it would infinitely loop in the while loop because there was no connections beyond the first one because it passed only one node back from the getfromnode function. I made some functions to do what was described in the book, including functions to check the presence of a specific node in the closed or open list, find a node in the open list, find the smallest node in the open list, and get the vector index of the node so that the node could be removed properly from the open list later.

A*

A* is the same exact as Dijkstra, but instead of finding the smallest cost of a node, the smallest element function looks for the node that is the shortest distance from the target. This is the heuristic which believes that if the node is closer to the target, that must mean it is the shortest path to it.

Input Manager

Input Manager recieved the escape calls, the mouse input, and keyboard input. When it gets an input. It sends out a "switchpathingmessage" which tells the gameapp to switch pathing algorithms, and for the girdpathfinder to change colors.

Grid

Changed the grid to have no diagonals.

GridPathfinder

Gave it a switch color function which is called by the switch pathing message to chage color based on the input of the user by using a char variable.

Other things to note

Despite having changed the program to have no diagonals, the code still finds a way to go diagonally which creates pathing that is not optimal. I do not know how to fix this since most people told me once I changed the grid it would fix it but it didn't. I don't know if it is something wrong with my pathfinding finding the smallest element, but it is causing some weird "blobbing" effects in the pathfinding.