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CS3050

Due Date:
8 December, 2017

Project Report Group 17

Description:

The project consists of 3 main functional algorithms, the first is the main, which will call the other two functions: parsing and recursive maze solve. Parsing will iterate through each line present in the input file, check if the current character is valid, dynamically allocate for it, and add a corresponding character to a 2d character array. Recursive maze solve is an algorithm that uses two additional 2d arrays. These are wasHere, which determines if the robot has already reached a point in the maze before, and correctPath, which contains the correct line from start to endpoints of the robots. Recursive solve will send recursive calls to all adjacent squares to the start point and find whether or not they are either, empty spaces, walls, or already reached spaces. This will continue until the endpoint is reached or until there is no more spaces for the recursive algorithm to move to.

Algorithm analysis:

Parsing: O(n) where n is the number of characters in the input file
Recursive maze solve: O(l*w) where l is the number of rows in the 2d array and w is the number of columns in the 2d array.

Paul:

Lead developer of parsing code and memory. Created the functions for reading in the input file and error checking said input file. Also created algorithm for copying input file into dynamically scaling double pointer which serves as the maze.

Jordan:

Lead integration manager. Tasked with combining source code from all project members. Checked errors in project members's code and corrected them. Also made sure that each members code and terminology was in sync so that the program could compile and execute properly.

Sarah:

Lead developer of pathing algorithm. Decided on a suitable algorithm that met the standards of the prompt and implemented code for the two robots two navigate through the provided maze. Also wrote majority of the code in main.c

Travis:

Lead research and analysis advisor. Did necessary research on maze solving algorithm and found potential solutions for the project. Also helped with debugging on both parsing and maze algorithm.Created the readme's and project report. Also found complexity of algorithms in the project.