Weun (William) Son

Professor Hybinette

CS4070

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Report for Project 3

I implemented the A star, Dijkstras, and Best First algorithms. I have an animation speed slider, which controls the speed of the animation. I have two input boxes for the width and height. To use this function, you have to input a width and height for each respective box and press on the Reset Grid button. This makes a new grid with the specific height and width. I have four buttons: Start A* Algorithm, Start Dijkstra’s Algorithm, Start Best First Algorithm, and a Reset Grid button. The A* algorithm button starts the animation for the A* algorithm. This checks to see that the f cost is lower than the f cost in the open list. If it is then, make this your current node. The Dijkstra’s Algorithm starts the animation for the Dijkstra’s algorithm. This algorithm checks to see that the h cost of the open list of nodes is smaller than the current h cost of the node. If it is smaller then, we use this node as the current node. The Best First algorithm button starts the algorithm for the best first algorithm. This algorithm checks to see that the g cost of the open list of nodes is smaller than the current g cost of the node. If it is smaller then, we use this node as the current node.

I have three javascript files: Tile.js, Grid.js, and Pathfinding.js. Tile.js creates the constructor for the tiles and has the drawTiles method (creates tiles) and the getNeighbors(Tile) method (Takes in a tile and returns a tile array of neighbors). Grid.js initializes the grid and clears the grid when needed. Pathfinding.js has the code for the algorithms.

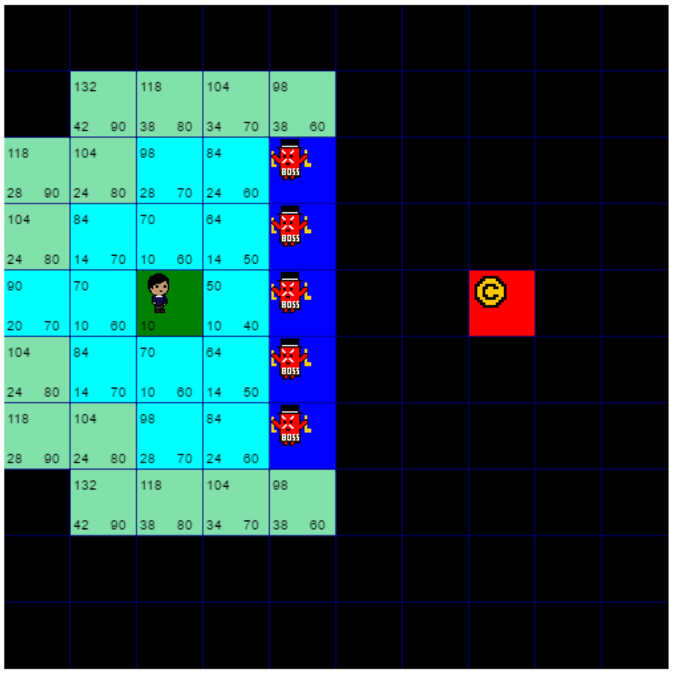
I have screenshots below. The results turned out great. I checked the A* algorithm multiple times and made sure that it was outputting the correct values.

Note: if the width and size are too large, the f,h, and g cost values will not show.

A* Path Finding Algorithm Implementation

Instructions :

Press the reset button to clear the grid.
Click once on a tile to set the start node (GREEN).
Click again on a tile to set the goal node (RED).
Every consecutive click after the goal node will be obstacle nodes (BLUE).
Configure Size: Input a number for both the height and width input boxes and then press Reset Grid.
You can control the speed of the animation by sliding the animation slider to the right to go faster and left to go slower.


132 42 90 | 118 38 80 | 104 34 70 | 98 38 60
118 28 90 | 104 24 80 | 98 28 70 | 84 24 60 | BOSS
104 24 80 | 84 14 70 | 70 10 60 | 64 14 50 | BOSS
90 20 70 | 70 10 60 | 10 | 50 10 40 | BOSS
104 24 80 | 84 14 70 | 70 10 60 | 64 14 50 | BOSS
118 28 90 | 104 24 80 | 98 28 70 | 84 24 60 | BOSS
132 42 90 | 118 38 80 | 104 34 70 | 98 38 60

Animation Speed: **Width:** 10 **Height:** 10

Start A* Algorithm | Start Dijkstra's Algorithm | Start Best First Algorithm | Reset Grid

Path Length: 0
Number of steps taken: 0

A* Path Finding Algorithm Implementation

Instructions :

Press the reset button to clear the grid.
Click once on a tile to set the start node (GREEN).
Click again on a tile to set the goal node (RED).
Every consecutive click after the goal node will be obstacle nodes (BLUE).
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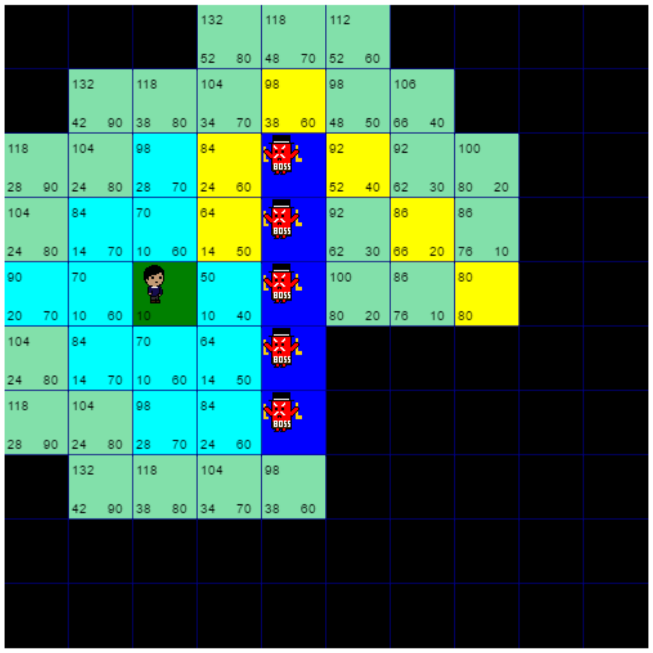


			132 52 80	118 48 70	112 52 60				
	132 42 90	118 38 80	104 34 70	98 38 60	98 48 50	106 66 40			
118 28 90	104 24 80	98 28 70	84 24 60	BOSS	92 52 40	92 62 30	100 80 20		
104 24 80	84 14 70	70 10 60	64 14 50	BOSS	92 62 30	86 66 20	86 76 10		
90 20 70	70 10 60	10	50 10 40	BOSS	100 80 20	86 76 10	80 80		
104 24 80	84 14 70	70 10 60	64 14 50	BOSS					
118 28 90	104 24 80	98 28 70	84 24 60	BOSS					
	132 42 90	118 38 80	104 34 70	98 38 60					

Animation Speed: **Width:** 10 **Height:** 10

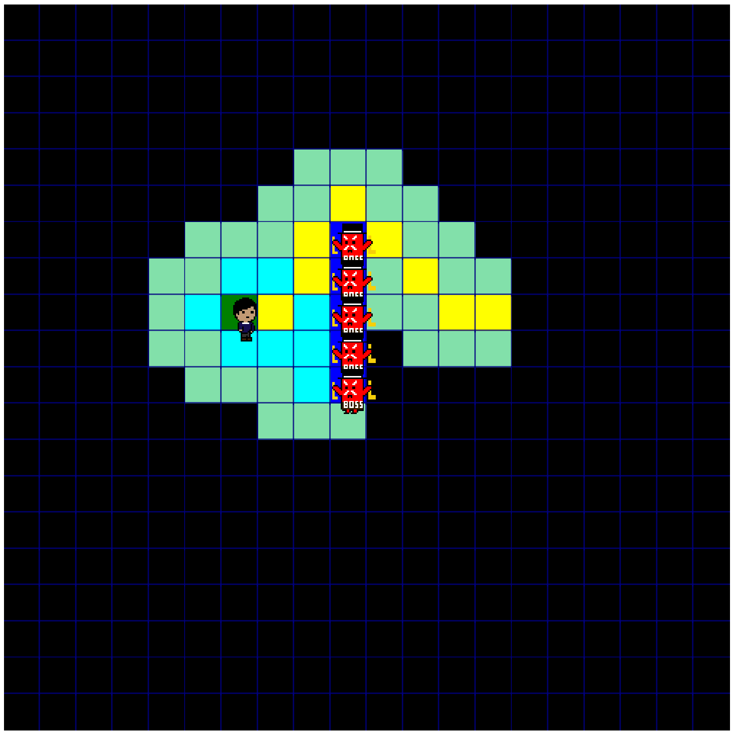
Start A* Algorithm   Start Dijkstra's Algorithm   Start Best First Algorithm   Reset Grid

Path Length: 6
Number of steps taken: 17

A* Path Finding Algorithm Implementation

Instructions :

Press the reset button to clear the grid.
Click once on a tile to set the start node (GREEN).
Click again on a tile to set the goal node (RED).
Every consecutive click after the goal node will be obstacle nodes (BLUE).
Configure Size: Input a number for both the height and width input boxes and then press Reset Grid.
You can control the speed of the animation by sliding the animation slider to the right to go faster and left to go slower.



Animation Speed: **Width:** 20 **Height:** 20

Start A* Algorithm Start Dijkstra's Algorithm Start Best First Algorithm Reset Grid

Path Length: 8
Number of steps taken: 16