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CS420

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Project Report

	Uniform Cost Search			Astar Search		
	#nodes explored	Solution length	Is it optimal?	#nodes explored	Solution length	Is it optimal?
tinyMaze	15	8	Yes	15	8	Yes
medium Maze	268	68	Yes	223	68	Yes
bigMaze	619	210	Yes	543	210	Yes

In this project, the Uniform Cost search is doing all most the same as the breadth-first search as the cost of step in the maze is always 1. So, as discussed before, although it will always generate an optimal solution, the number of nodes it needs to expand will be large. Astar, on the other hand, will always generate the optimal solution and the node it needs to expand will be less than UCS.

The biggest difference between UCS and Astar is the heuristic function. For UCS, it does not have any extra information of goal and the costs of every edge are identical. It just expands the least cost node. For Astar search, because it is informed, it uses the heuristic function to estimate the distance from the current state to goal. That is the reason while both methods try to expand the least cost nodes, but Astar will minimize the number of nodes it expanded.