

355 fall 2020 worksheet 4 due Tue Oct 13

You can work on this assignment with anyone or anything, but you must acknowledge all people/things who give you any info. You must write all your answers in your own words: do not copy anyone/anything else. We might ask you later to explain your answers: if you cannot, we might deduct some or all marks, and of course report any suspected plagiarism to the appropriate authorities.

Your hash value for this worksheet is the 4th digit of your student number, mod 5. E.g. if your student number is ***8*** then your hash value is 3.

1. [1 mark] **If you don't answer this question, we won't be able to mark the rest of your assignment.** Give the names of all persons you consulted on this assignment, and explain who each is (e.g. classmate, friend, family, etc.). Other than the class webnotes, lectures and github repo, list any resource (book, url, video, etc.) you consulted.
2. [4 marks] Here is how a graph helps solve the maze traversal problem.
 - each node in the graph corresponds to a cell of the maze, and vice versa,
 - each edge in the graph represents
_____ (in your own words, explain), so a path through the graph corresponds to a path through the maze.
 - to solve the maze problem, our task is simply to construct the adjacency graph and then _____ .
 - two graph algorithms that solve this task are
_____ search and _____ search.
3. [4 marks] Explain how a graph helps solve the sliding tile problem.
 - Each node in the graph corresponds to a
_____ and vice versa,
 - each edge in the graph represents
_____ ,
 - a path through the graph corresponds to
_____ ,
 - a solution to a sliding tile puzzle position is a sequence of moves that takes us from the initial given position to the final sorted position: in the graph, this corresponds to
_____ .
4. [6 marks] For a sliding tile puzzle, your row and column dimensions are D_k below, where k is your key. For your dimensions, give the number of nodes, edges, and connected components in the sliding tile state space graph. Show your work. Explain in your own words.

D_0 3x5

D_1 3x6

D_2 3x7

D_3 3x8

D_4 3x9