EN.530.663: Robot Motion Planning
Homework 2

Jin Seob Kim, Ph.D.
Senior Lecturer, ME Dept., LCSR, JHU

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Problem 1

Write a Matlab function code for Dijkstra's algorithm. Also write a main script file where you can test your function code. Inputs of the function should include: weighted adjacency matrix of the graph G, the initial node n_{init}, and the goal node n_{goal}. Output should be the shortest path.

Problem 2

Write a Matlab function code for A* algorithm. Also write a main script file where you can test your function code. Inputs of the function should include: weighted adjacency matrix of the graph G, the initial node n_{init}, and the goal node n_{goal} ($h(n)$ can also be included of course). Output should be the shortest path. For this problem, since we deal with a general graph, try the following two heuristic functions

1. The one in the example in the lecture.
2. The sum of each row in G' where G' is the same as G except "Inf" is replaced by 0 (i.e., G' is just the adjacency matrix).

Also discuss about the heuristic functions given above. Do you think they are good as heuristic functions?

Submission Guideline

- Submit all your Matlab codes in a single .zip file (which has two zip files for problem 1 and 2). Name your single zip file submission as "YourName_HW2.zip", and two sub-zip files as "YourName_HW2_Prob1" and "YourName_HW2_Prob2". For example, "JinSeobKim_HW2.zip" for a single zip file. Submission will be done through Gradescope.

- Please make sure to include *all the necessary files*. If TAs try to run your function and it does not run, then your submission will have a significant points deduction.
- *Your codes must be written based on the pseudocodes in the hand-outs*. For example, you will have to use the same variable names from each pseudocode in your Matlab code.
- Also put as much comments as possible so that the TAs can easily read your codes.
- If you want to use other languages such as python, please consult the instructor first.