Assignment 1

Part A

CSED342 – Artificial Intelligence

20200811 맹찬영

Q1) What is the size of the state space when the grid is M by N? Justify your answer. You should assume that all configurations are reachable from the start state. (2 pts)

* size of the state space : 4\*M\*N\*(Vmax + 1)

agent positions : M \* N, agent direction : 4 (N, S, E, W),

agent velocity : 1 + Vmax (0, 1, 2, , Vmax)

Q2) What is the maximum branching factor of this problem? You may assume that illegal actions are simply not returned by the successor function. Briefly justify your answer. (2 pts)

* when the agent is in stop, agent might turn right or turn left or fast (can’t slow) : 3
* If the agent in moving, agent might fast or slow (can’t turn) : 2
  + Therefore, maximum branching factor of this problem is 3

Q3) If we used an inadmissible heuristic in A\* tree search, could it change the completeness of the search? (2 pts)

* It couldn’t change the completeness of the search.
* Even if the heuristic value is larger than actual cost, A\* tree search could find the solution through another path. (As we don’t stop A\* algorithm when we enqueuer a goal, but stop A\* when we dequeuer a goal, we can find the solution.)

Q4) If we used an inadmissible heuristic in A\* tree search, could it change the optimality of the search? (2 pts)

* It could change the optimality of the search.
* As I mentioned in Q3, if we used an inadmissible heuristic in A\* tree search, solution path could be estimated worse than other path. (We couldn’t find the solution path optimally.)