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CIS 471: Introduction to Artificial Intelligence

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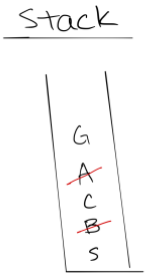
Homework 1

1. Uninformed Search
    i. There are *7* nodes in the complete search tree for the state space graph.
    ii. Final path: *S* – *A* – *C* – *G*

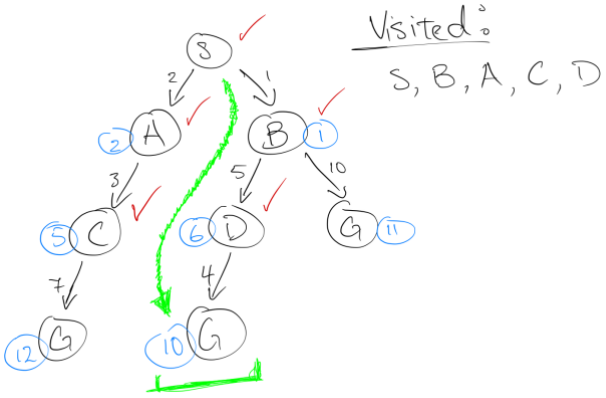
    iii. Final path: *S* – *C* – *G*



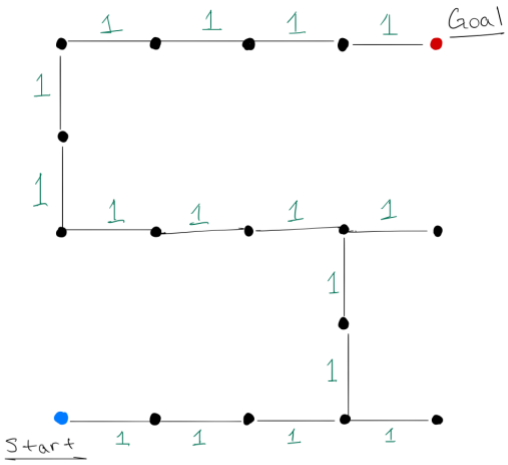
2. Informed Search
    i. Final path: *S* – *A* – *D* – *G*

Nodes	Total Heuristic	
S	0	
B	4	from S
A	5	from S
D	5	from A
C	6	from A
G	7	from D

ii. Final path: $S - B - D - G$



3. Hive Minds: Lonely Bug
    i. We can use (x, y) to store the coordinates of the insect's location at each instance. The size of the state space is thus $M * N$.



    ii. Two admissible heuristics:
        - Measure the Manhattan distance between the insect and the target location.
        - Measure the Euclidean distance between the insect and the target location.
4. Hive Minds: Time Limit
    i. 2
    ii. 8
    iii. 8
5. Lookahead Graph Search
    i. Final path: $S - B - G$