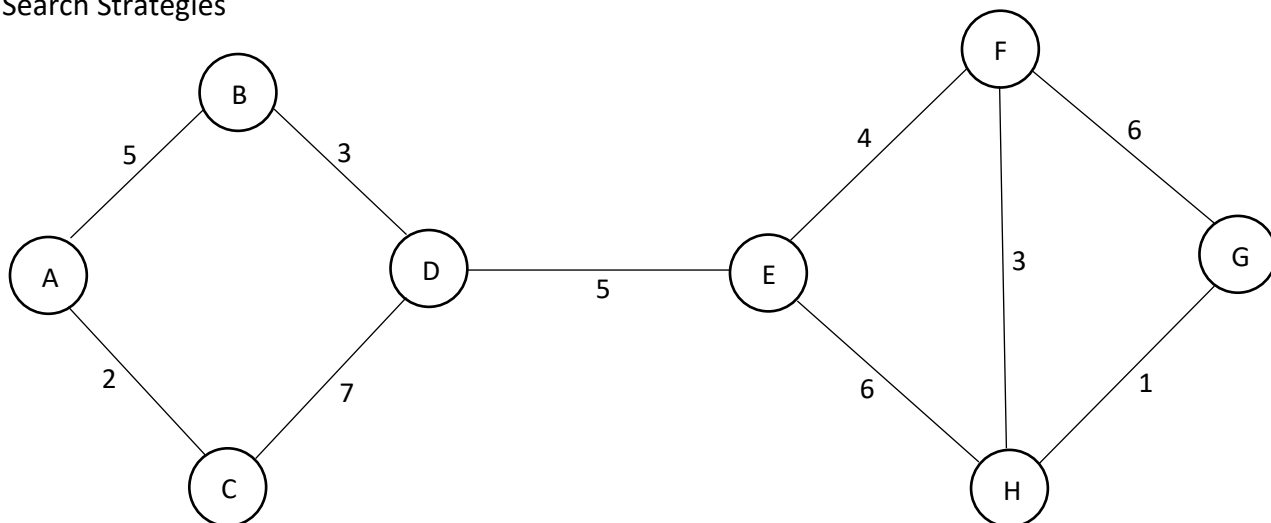


CCIS 4100: Written Exercise on Search and Minimax

Byron C. Wallace

Search Strategies



Question 1. [10 points]

Consider the state space graph shown above. A is the start state and G is the goal state. The costs for each edge are shown on the graph. Each edge can be traversed in both directions.

(a) For each of the following graph search strategies (do not answer for tree search), mark which, if any, of the listed paths it could return. Note that for some search strategies the specific path returned might depend on tie-breaking behavior. In any such cases, make sure to mark all paths that could be returned under some tie-breaking scheme [6 points]

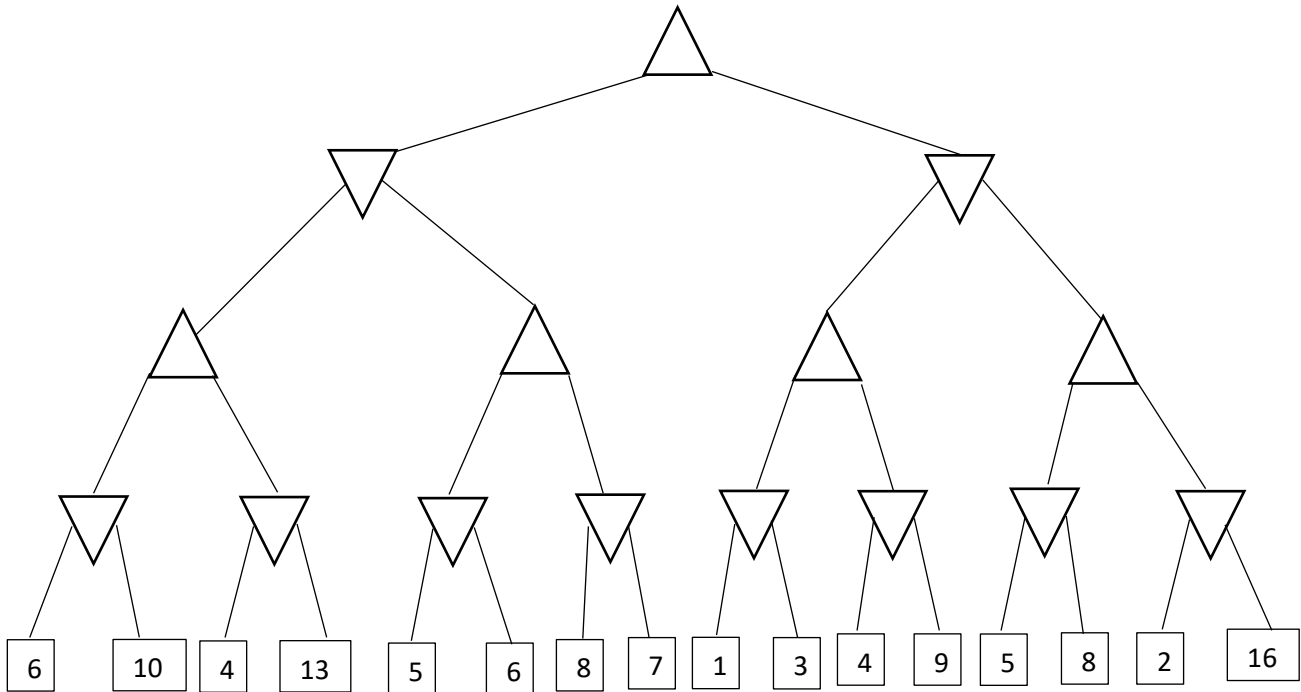
Search Algorithm	A-C-D-E-H-G	A-B-D-E-F-G	A-B-D-E-H-G
BFS			
DFS			
UCS			

(b) Heuristic function properties Suppose you are completing the new heuristic function  $h$  shown below. All the values are fixed except  $h(C)$ . [4 points]

Node	A	B	C	D	E	F	H	G
H	15	12		9	4	3	1	0

What values of  $h(C)$  make  $h$  consistent? Also, give the path obtained by using A\* search algorithm using a consistent value for  $h(C)$ .

## Alpha Beta Pruning



Question 2. [10 points]

On the minimax game tree below cross out the branches removed by alpha-beta pruning assuming left to right traversal and write down the alpha beta values at each step of the search tree.