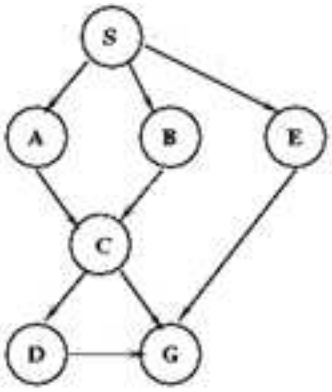
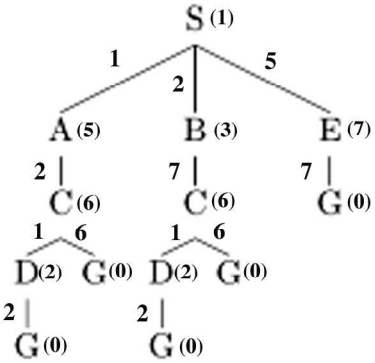
6.034 Recitation 2: Optimal Search Exercises (9/24/04)

LOrtiz (Orig. by KKoile)

1. Draw the graph at left as a tree. (We did this last time.)





Link lengths:

S-A	1	C-D	1
S-B	2	C-G	6
S-E	5	D-G	2
A-C	2		
B-C	7		
E-G	7		

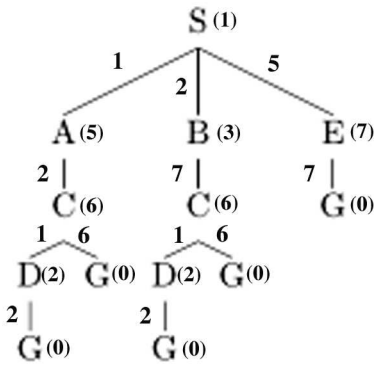
Estimates of distance to G from:

A	5
B	3
C	6
D	2
E	7
G	0
S	1

2. Using branch and bound without an extended list, identify the shortest path from S to G, enumerating in order the partial paths encountered and their lengths. (Note: This is a short cut to working through the branch and bound algorithm showing the contents of the queue after each node extension step. Either method should produce the same answer.) You may write partial paths in either direction (e.g. either (S A) or (A S)).

Partial path	Length

(over)



3. Now search the same graph (repeated above) for the shortest path from S to G using A* and an extended list. Fill in the table below, enumerate the order in which nodes are extended, and give the path. Assume new nodes are added to the front of the queue in left to right order, and that ties in choice of which node to extend are broken by picking the node closer to the front of the queue.

Queue	Extended list	Next node to extend	Not extended
(1 S)	()	(1 **S**)	

4. Which of the heuristic values for distance to G is inadmissible? Why?