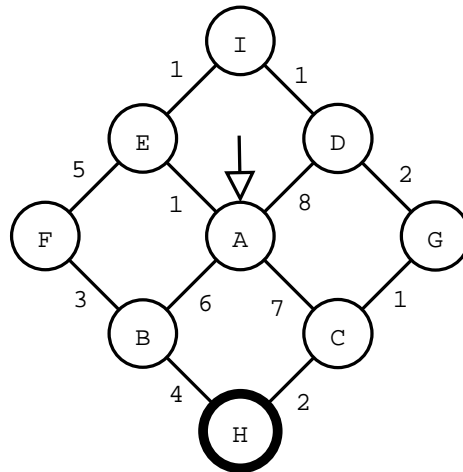


CS347 SP2005 Exam 2

This is a closed-book closed-notes exam. The *only* items you are permitted to bring are writing implements. Mark every sheet of paper you use with your name and the string “cs347sp2005 exam2” (omittance, even if it is partial, will be penalized at 1 point per sheet). If you are caught cheating, you will receive a zero grade for this exam. The max number of points per question is indicated in square brackets after each question. The sum of the max points is 75. You have 75 minutes to complete this exam. Good luck!

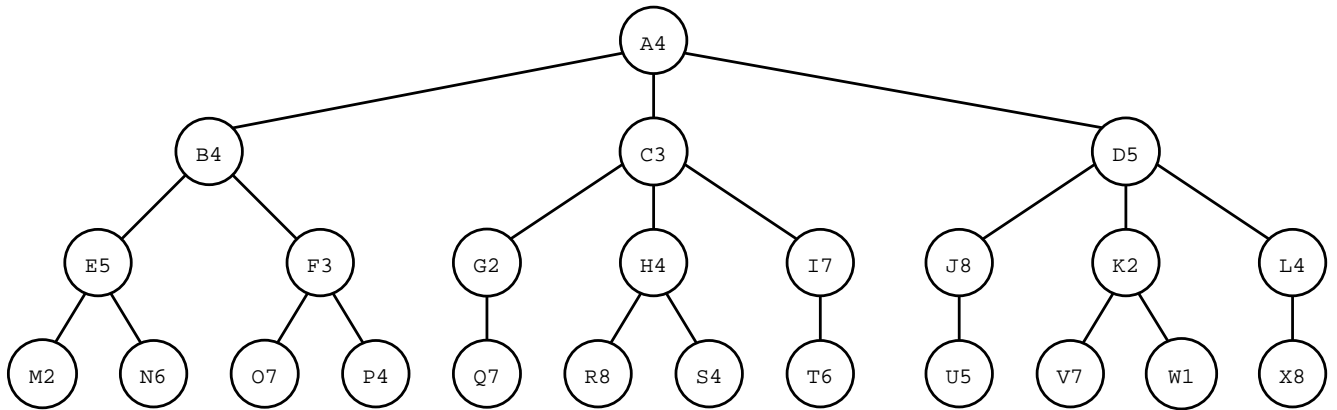
All the questions on this page are about the following state space graph, with A being the start state and H being the goal state. The order in which successors are generated is counterclockwise, ending at exactly 9 o'clock. Example: A generates first B, then C, then D, and finally E. When sorting by path-cost, nodes with equal path-cost are ordered such that the earlier a node is generated, the higher its priority. Nodes already on the open list have higher priority than newly added nodes with equal path-cost. Heuristic $h(node)$ is defined in the following table:

<i>node</i>	$h(node)$
A	9
B	1
C	2
D	3
E	2
F	5
G	1
H	0
I	3



1. Give the execution trace of ID-DFGS. [8]
2. Give the execution trace of UCGS. [12]
3. Give the execution trace of GBeFGS employing as heuristic $h(n)$. [4]
4. Give the execution trace of A*GS employing as heuristic $h(n)$. [12]
5. Is UCGS optimal for this problem? Explain your answer! [3]
6. Is ID-DFGS optimal for this problem? Explain your answer! [2]
7. Is GBeFGS employing heuristic $h(node)$ optimal for this problem? Explain your answer! [2]
8. Is $h(node)$ admissible for this problem? Explain your answer! [3]
9. Is $h(node)$ consistent for this problem? Explain your answer! [2]
10. Is A*GS employing heuristic $h(node)$ optimal for this problem? Explain your answer! [2]

All the questions on this page are about the following adversarial search tree. State evaluation heuristic values for the max player are provided in the form of numbers following the letter labels of the states (e.g., A4 indicates that the heuristic value of state A for the max player is 4). The order in which successors are generated is from left to right. Example: A generates first B, then C, and finally D.



11. Give the execution trace for ABIDM(A,3,-∞,∞). [20]
12. Which nodes, if any, would get pruned by ABDLM(A,3,-∞,∞) (not ABIDM!)? [3]
13. Give the Principal Variant (PV) which would be found by ABDLM(A,3,-∞,∞) (not ABIDM!). [2]