

Artificial Intelligence
 Test1 21.4.2006

1. Explain briefly
 - a) Turing's test (3p)
 - b) Reduction. (3p)

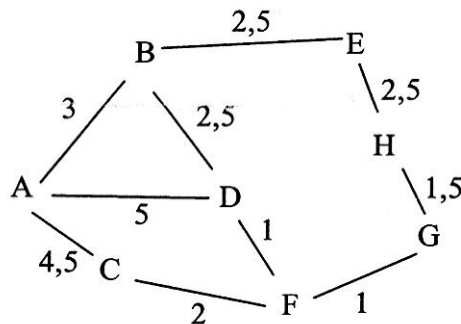
2. You have three jugs which we will call A, B and C. Jug A can hold exactly 8 cups of water, B can hold exactly 5 cups and C can hold exactly 3 cups. In the beginning, A is full of water and B and C are empty. You have to divide the contents of A equally with A and B so that both have 4 cups of water. You are allowed to pour water from jug to jug.
 - a) Find a state presentation for the problem. (2p)
 - b) Draw the search graph and solve the problem. (4p)

3. a) Which two conditions must a heuristic function h' fulfil so that heuristic algorithm A* finds the optimal solution? (2p)
- b) Apply heuristic search to find a path from state A to state G in the graph below. Use the following heuristic function:

$$h'(A)=7, h'(B)=5, h'(C)=4, h'(D)=2, h'(E)=2, h'(F)=2, h'(G)=0$$

If you need to choose between two equal nodes, pick the one that is first in alphabetical order.

(4p)



3. a) Name three conditions that must hold on a game for MIN-MAX -technique to be applicable. (3p)
- b) Apply alpha-beta-pruning to the game tree shown below. (3p)

