Homework 2 for DCP-1172 (2004.10.26)

• This time, we have 3 different homework assignments.
  ▪ Homework assignment 2-1 (50%, Ch3 & Ch4.)
  ▪ Homework assignment 2-2 (25%, Ch5.)
  ▪ Homework assignment 2-3 (25%, Ch6.)

▪ It is due on Nov. 12.
The following figure shows a portion of a partially expanded search tree. Each arc between nodes is labeled with the cost of the corresponding operator, and the leaves are labeled with the value of the heuristic function, $h$.

Which node (use the node’s letter) will be expanded next by each of the following search algorithms?

(a) Depth-first search
(b) Breadth-first search
(c) Uniform-cost search
(d) Greedy search
(e) A* search
Consider the following logic puzzle:

In five houses, each with a different color, live 5 persons of different nationalities, each of whom prefer a different brand of cigarette, a different drink, and a different pet.

Give the following facts, the question to answer is: “Where does the zebra live, and in which house do they drink water “

- The Englishman lives in the red house.
- The Spaniard owns the dog.
- The Norwegian lives in the first house on the left.
- Kools are smoked in the yellow house.
- The man who smokes Chesterfields lives in the house next to the man with the fox.
- The Norwegian lives next to the blue house.
Homework 2-2b: Constraint Satisfaction Problems  
(cont., AIMA-ch5, Ex.5-13)

- The Winston smoker owns snails.
- The Lucky Strike smoker drinks orange juice.
- The Ukrainian drinks tea.
- The Japanese smokes Parliaments.
- Kools are smoked in the house next to the house where the horse is kept.
- Coffee is drunk in the green house.
- The Green house is immediately to the right (your right) of the ivory house.
- Milk is drunk in the middle house.

• Discuss different representations of the problem as a CSP. Why would one prefer one representation over another?
Consider the following game tree in which the evaluation function values are shown below each leaf node. Assume that the root node corresponds to the maximizing player. Assume the search always visits children left-to-right.

(a) Compute the backed-up values computed by the minimax algorithm. Show your answer by writing values at the appropriate nodes in the above tree.

(b) Compute the backed-up values computed by the alpha-beta algorithm. What nodes will not be examined by the alpha-beta pruning algorithm?

(c) What move should Max choose once the values have been backed-up all the way?