cpt_s 540 Artificial Intelligence

Homework 4

11641327 Yu-Chieh Wang

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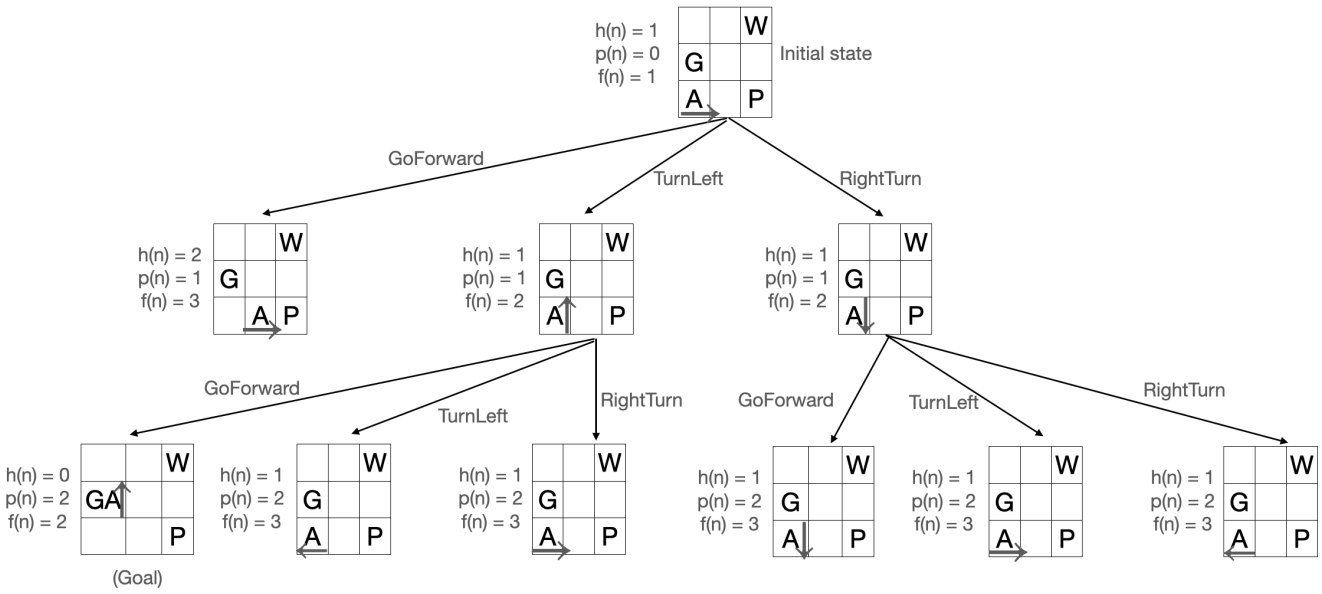
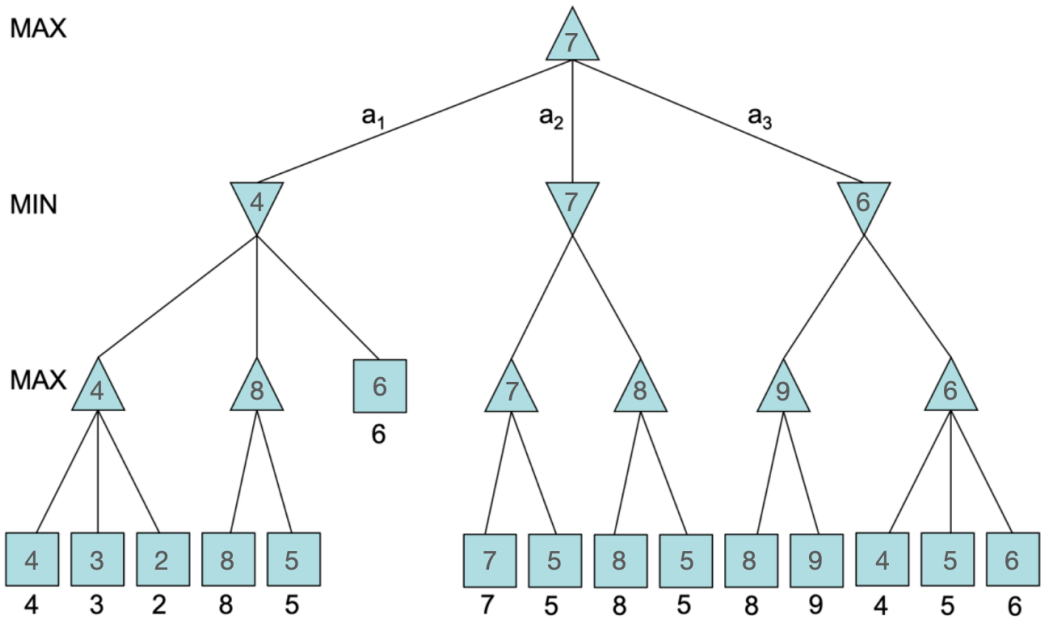
1. Using A* search on 3x3 Wumpus World search problem.



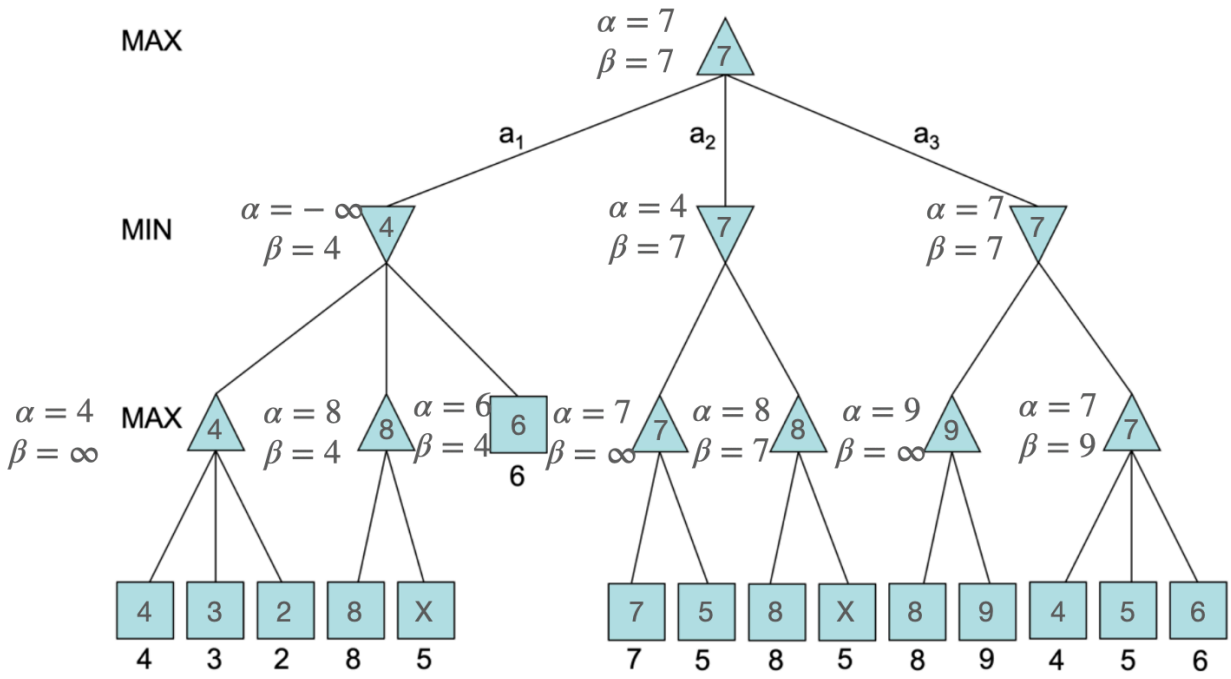
2. Tree.

   a. Minimax-Decision search



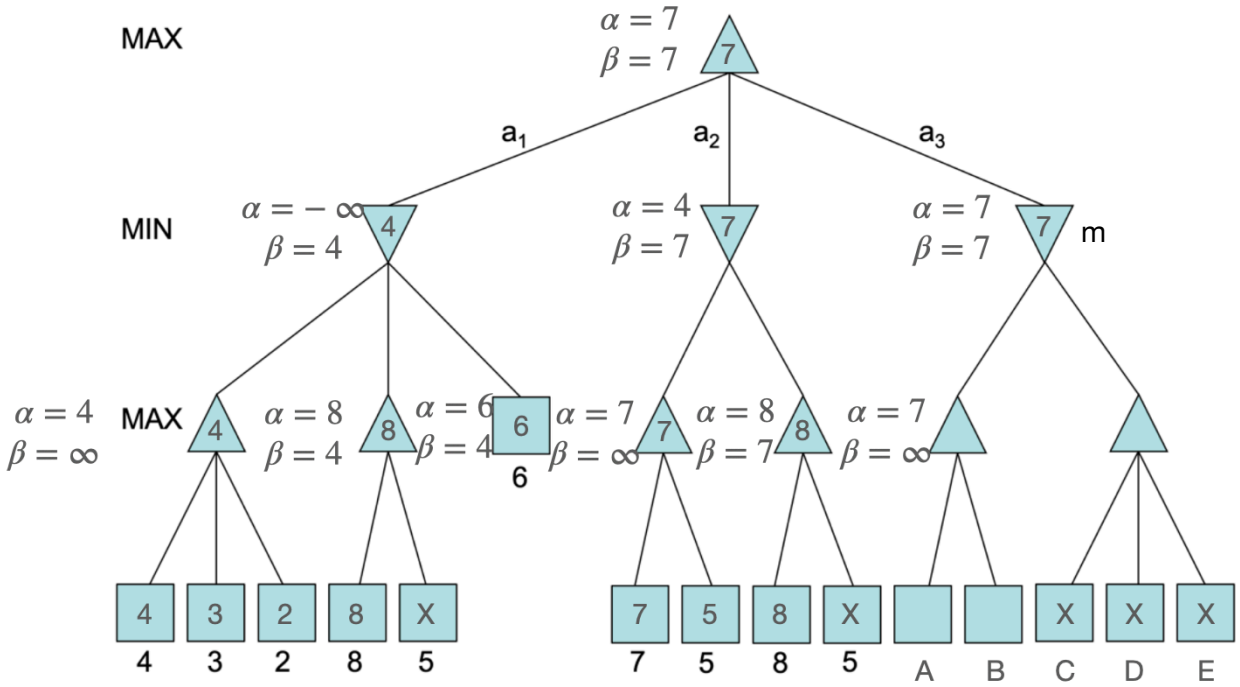
According to the result, MAX should take a2 because that one has the biggest value.

b. Alpha-Beta search



Consider to the result, MAX is able to take two ways a2 and a3 because their value are the same.

c. Maximize the number of nodes pruned by the Alpha-Beta search



First, we mark the five nodes as A, B, C, D, and E. Second, according to the algorithm, when the left branch of a node returns and replaces one value of its α or β, check whether the values can trigger the pruning function. Therefore, we go back to find the node m which is closest to the root, and think about how to change its α and β to trigger pruning, so it can maximize the number of nodes pruned. Next, the only thing we need to do is making sure the values of nodes A and B smaller than or equal to 7, so when the value return, it will replace m's β to 7 and trigger pruning.