AI Homework 3 – A*, minimax, and alpha-beta pruning

| B	B	B		W	W	W

Figure 4.29   The sliding block puzzle.

1. The sliding-tile puzzle consists of three black tiles, three white tiles, and an empty space in the configuration shown above (also Figure 4.29 in our textbook).

The puzzle has two legal moves with associated costs:

- A tile may move into an adjacent empty location. This has a cost of 1.

- A tile can hop over one or two other tiles into the empty position. This has a cost equal to the number of tiles jumped over.

The goal is to have all the white tiles to the left of all the black tiles. The position of the blank is not important.

a.) Analyze the state space with respect to complexity and looping.

b.) Propose a heuristic for solving this problem and analyze it with respect to admissibility, monotonicity, and informedness..

MAX

A

B   C

D   E   F   G   H
3   5   4

I   J   K   L
     5   7   8

M   N
0   7
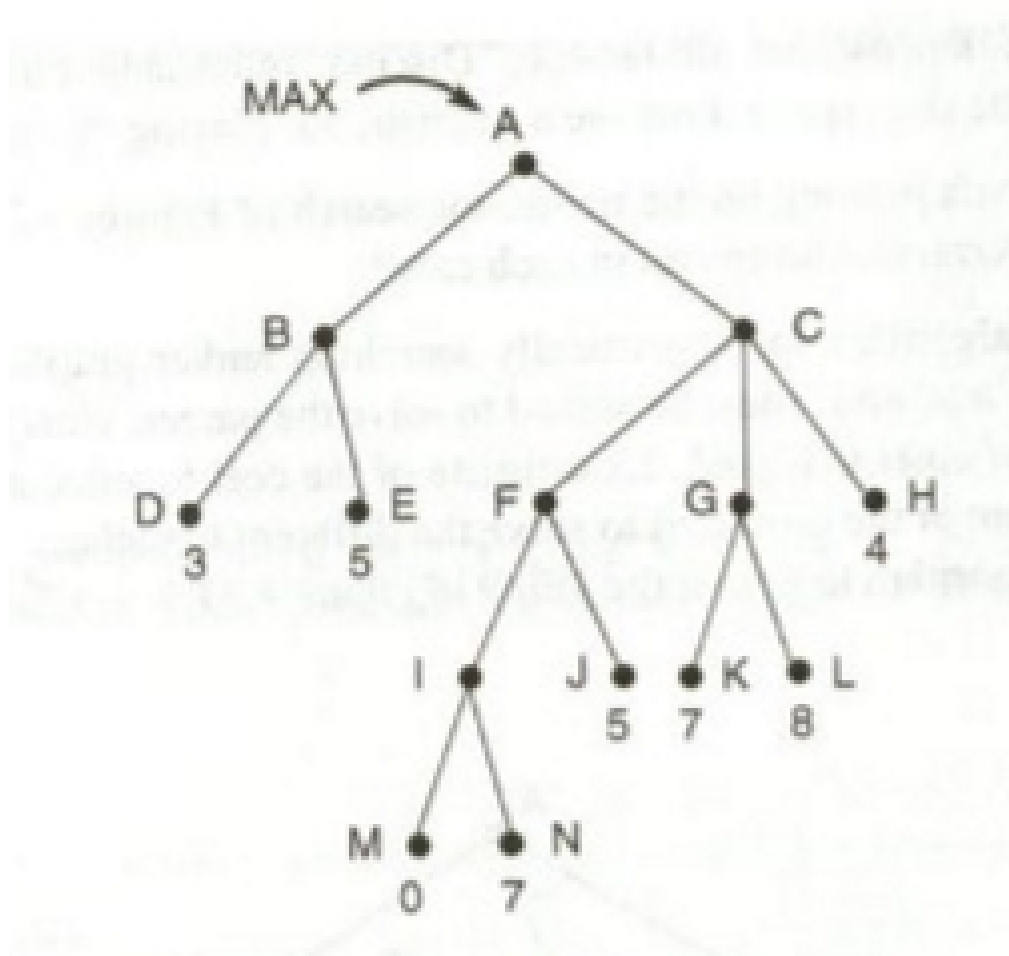
2. Perform minimax on the tree shown above (also Figure 4.30 in our textbook).

3. Perform left-to-right alpha-beta pruning on the tree shown above.

4. Perform a right-to-left alpha-beta pruning on the tree shown above. Discuss why a different pruning occurs.