Assignment 4 Comprehension

B351 / Q351

Due: February 20th, 2018 @ 11:59PM

1 Alpha Beta

1. Write down the α-β value of each of the nodes that are NOT pruned in α-β pruning.

MAX

MIN

MAX   5

MIN

MAX

MIN

0 -5 -3 3   3 -3 0 -2 -2 3   5 2 -5 5 0   1 5 1 -3 0 -5 5 -3 3
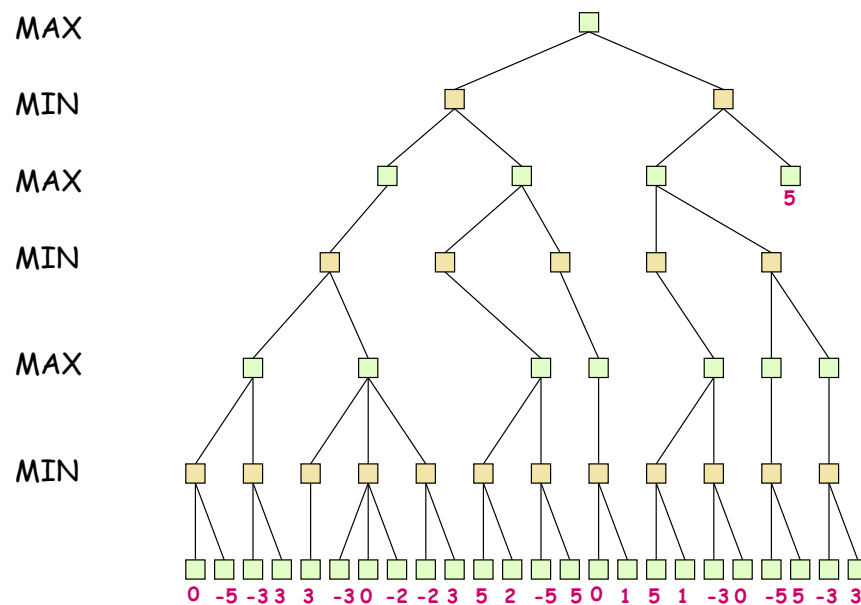
2. What is the optimal move for MAX?

3. Draw an example of a game tree (this tree does not have to be associated to a particular game) of depth 3 where α-β pruning will NOT prune anything.

2 Game Theory

Consider the following game played on a 1 x N board: Two players take turns writing on the board. Each player can place an L or an O, and the first player who produces three consecutive boxes that spell LOL wins the game. For example, if N = 3 a possible game is as follows:

The first player writes an L in the first square, so the game is at position

$$\text{L \_\_ \_\_}$$

The second player places an L in the last square, so the game is at position

<div align="center">L __ L</div>

[this is not a very smart move, by the way]
The first player places an O in the second square, so the game is at position

<div align="center">L O L</div>

(so the first player wins).

1. Suppose that the first player places an L in the fist square and that N = 4. Was this a good move? Justify your answer.

2. Who wins the game if N = 7? (the possibilities are the first player,the second player, or a draw. You must assume the players are playing to win!) Justify your answer.