Minimax Search

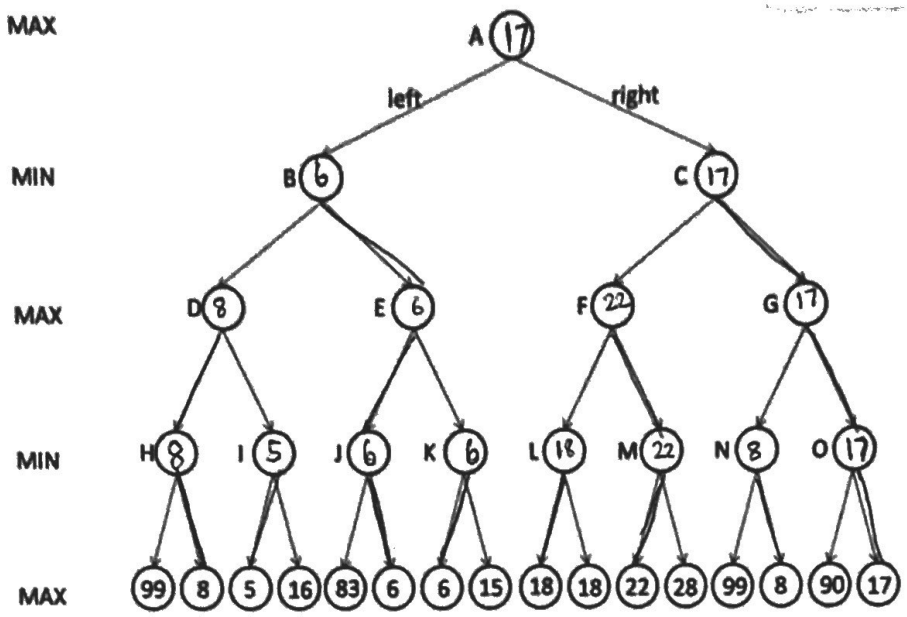


Figure 1: The adversarial search tree.

Alpha - Beta Pruning

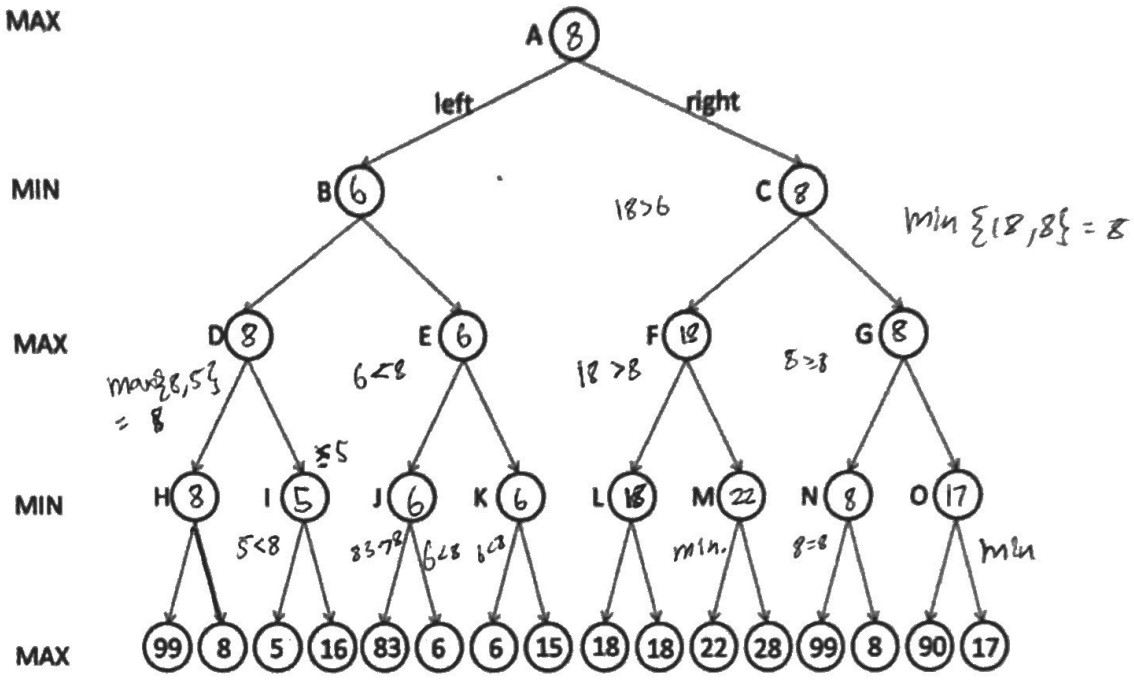
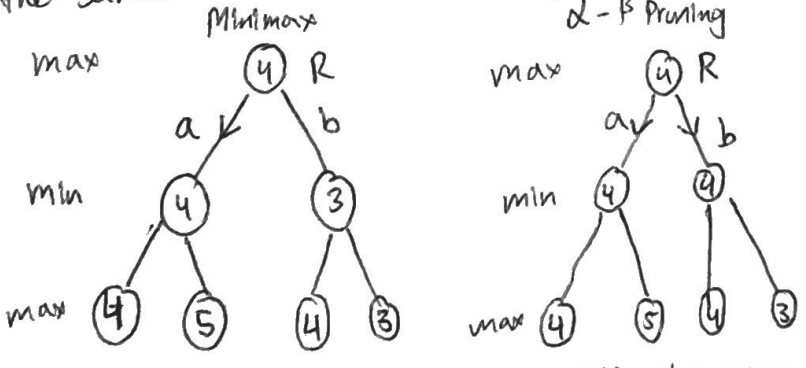


Figure 1: The adversarial search tree.

c) The max player at the root state, for the minimax algorithm. will choose "right action". The max player at the root state, for minimax with alpha-beta pruning, will choose the 'right' action as well.

The best move computed by the two versions is not guaranteed to be the same. Consider the following example:



This would be the only scenario in which a different possibility of outcomes is seen. Since α-β pruning relies on the following function in order to decrease its runtime:

$$R = \max\{\min\{a_1, a_2\}, f\}, \text{ where } f = \begin{cases} b_i \text{ for the first } i \text{ where } b_i \leq \min\{a_1, a_2\} \\ \text{otherwise } \min\{b_1, b_2\} \end{cases}$$

we may choose b_i, b_2, $\min\{a_1, a_2\} \geq b_1 > b_2$. The minimax chooses b_2, α-β chooses b_1.