

3.5.4.8 Exercise 6

Exercise 5 and 6

5. Perform (i) a **left to right** alpha-beta prune on the tree of Fig.ex5; (ii) **right to left** alpha-beta prune on the same tree. Discuss why different pruning occurs.
6. Consider the game tree in Fig. ex6. Explore the tree using **left to right** alpha-beta pruning. Indicate all nodes of the tree that are cut off. Indicate the winning path or paths.

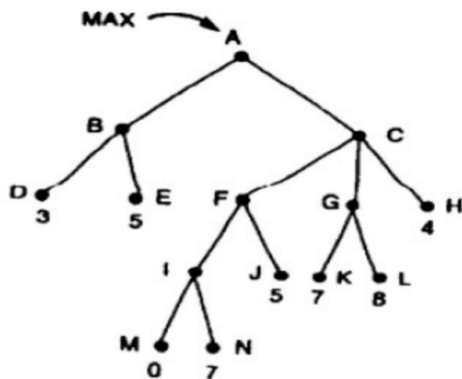


Fig.ex5

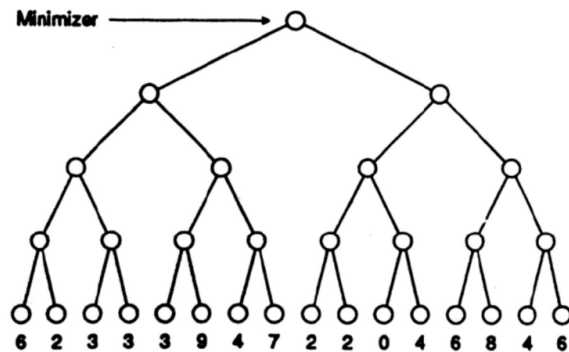


Fig. ex6

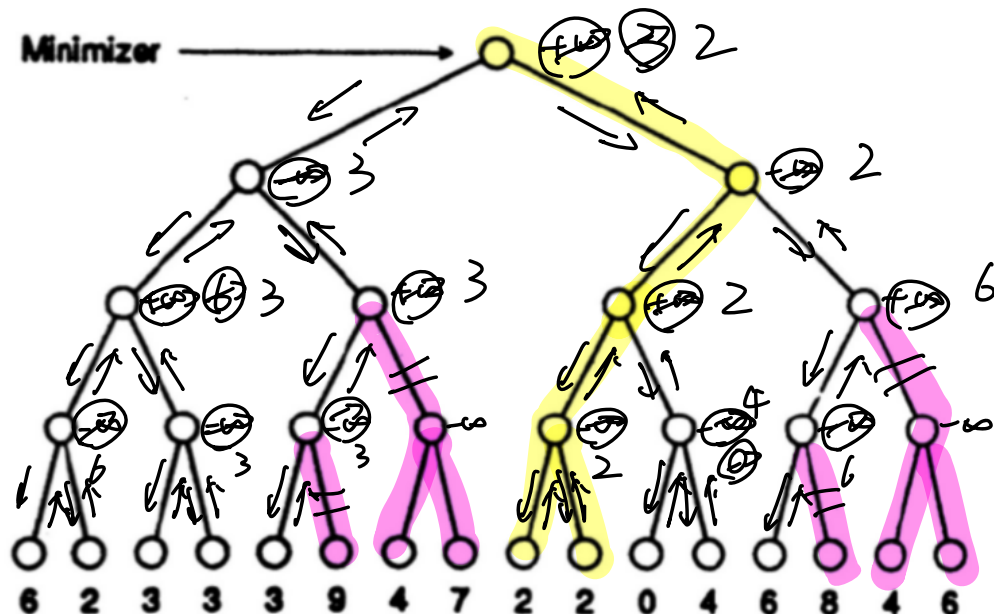
Solution

Min

Max

Min

max

 $\mu_i \wedge$ 

$$6 \geq +\infty \quad X$$

$$6 \leq -\infty \quad X$$

$$3 \geq 6 \quad X$$

$$3 \geq +\infty \quad X$$

$$3 \geq 3 \quad \checkmark$$

$$3 \leq 3 \quad \checkmark$$

$$2 > 3 \quad X$$

$$0 \geq 2 \quad X$$

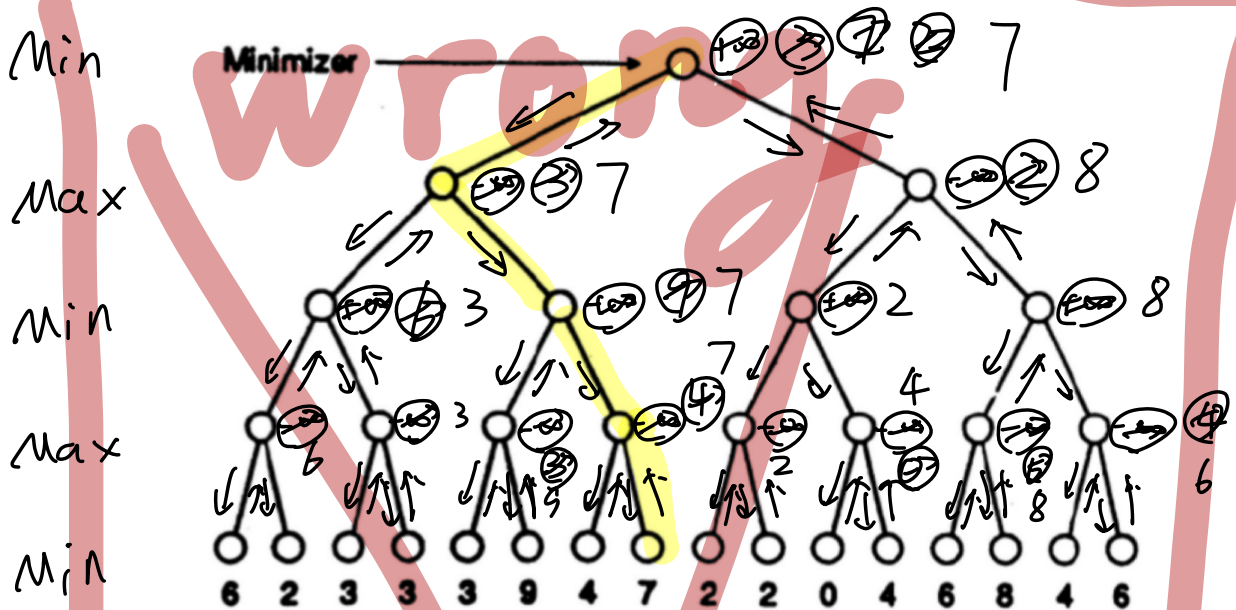
$$6 \geq 3 \quad \checkmark$$

$$6 \geq 2 \quad \checkmark$$

\geq road

to win

Solution ① initialize



$$6 \stackrel{?}{>} +\infty \quad X$$

$$6 \stackrel{?}{<} -\infty \quad X$$

$$3 \stackrel{?}{>} 6 \quad X$$

$$3 \stackrel{?}{>} +\infty \quad X$$

$$3 \stackrel{?}{>} +\infty \quad X$$

$$9 \stackrel{?}{<} 3 \quad X$$

$$4 \overset{?}{>} 9 \quad X$$

$$\min(9, 7) = 7$$

$$\max(3, 7) = 7$$

$$7 \overset{?}{>} 3 \quad X$$

$$2 \overset{?}{>} +\infty \quad X$$

$$0 > 2 \quad X$$

$$2 \overset{?}{>} 7 \quad X$$

$$4 \overset{?}{>} 8 \quad X$$

$$\max(8, 6) = 8$$