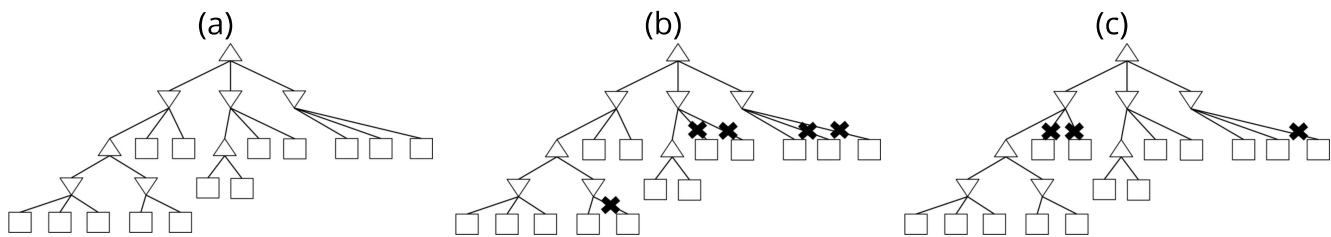


hw3_games_q6_possible_pruning

Question 6: Possible Pruning

0.0/5.0 points (graded)

Assume we run $\alpha - \beta$ pruning, expanding successors from left to right, on a game with tree as shown in Figure (a) below.



☒ There exists an assignment of utilities to the terminal nodes such that no pruning will be achieved (shown in Figure (a)). ✓

☒ There exists an assignment of utilities to the terminal nodes such that the pruning shown in Figure (b) will be achieved. ✓

☐ There exists an assignment of utilities to the terminal nodes such that the pruning shown in Figure (c) will be achieved.

☐ None of the above.

a) One such assignment:

3,3 | 5,5 | 6,6,6

4,4

1,1,1 | 2,2

b) One such assignment:

2,2 | x,x | 0,x,x

0,0

1,1,1 | 0,x

c)

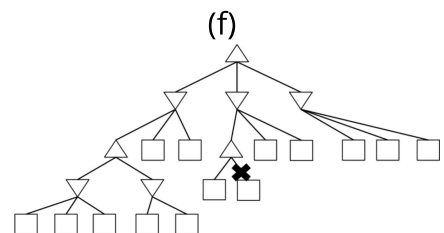
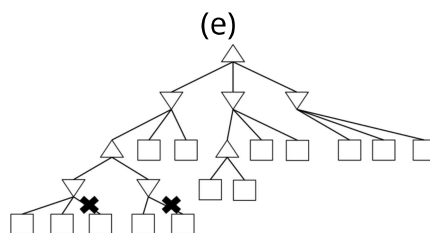
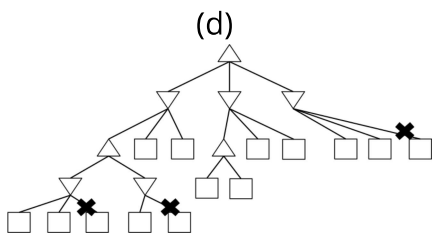
The left-most child of the root would have $\alpha = -\infty$, so its direct children can never be pruned because they will always be greater than $-\infty$. Intuitively the root hasn't seen anything else yet, so any value returned by the minimizer might end up being taken by its parent.

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i Answers are displayed within the problem

problem

0.0/5.0 points (graded)



- ☐ There exists an assignment of utilities to the terminal nodes such that the pruning shown in Figure (d) will be achieved.
- ☐ There exists an assignment of utilities to the terminal nodes such that the pruning shown in Figure (e) will be achieved.
- ☐ There exists an assignment of utilities to the terminal nodes such that the pruning shown in Figure (f) will be achieved.
- ☒ None of the above. ✓

d,e)

The left-most node has $\alpha = -\infty$, so any value seen will be greater than α , and thus none of its children can be pruned.

f)

The leaf that we want to prune has $\beta = \infty$, so any value in the first child will be less than β , and thus no pruning is possible

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i Answers are displayed within the problem

Note this is a challenging question, so we have provided an optional hint. It will benefit you most if you first think about this problem on your own, and then if stuck, use the hint to guide you. To read the hint click on the hint button. [Hint](#)