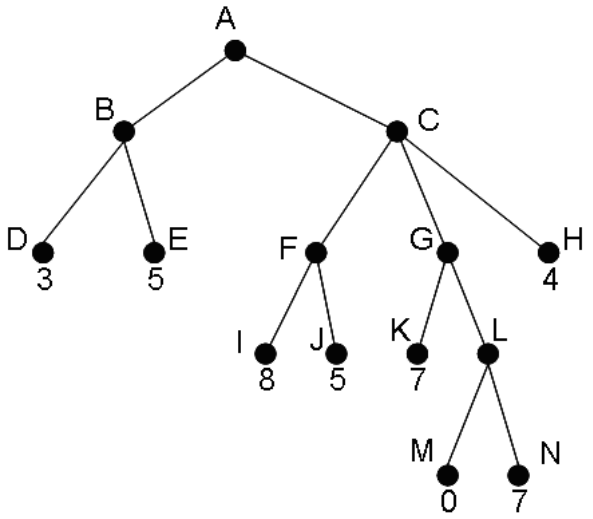
Artificial Intelligence 2007 Spring
Homework 4 Solution

April 29, 2007

1. $\alpha - \beta$ **pruning algorithm**
   Perform a left-to-right alpha-beta prune on the tree as following tree (Root is a maximizer.) Perform a right-to-left prune on the same tree. Discuss why a different pruning occurs.



Ans.

The results using $\alpha - \beta$ pruning from left to right and right to left are shown in Figure 1 and Figure 2. The value above an edge is the value returned by that node below. An edge connects with a pruned node has no value above it because pruned nodes are never being visited so they do not return any value. The result α and β values for internal nodes are shown beside that node.

The reason that why there are differences between these two results is that since α and β are the values of the best choice ***we have found so far*** in MAX and MIN nodes respectively, the order we visit the successors of one node obviously affects its result. If we visit first the

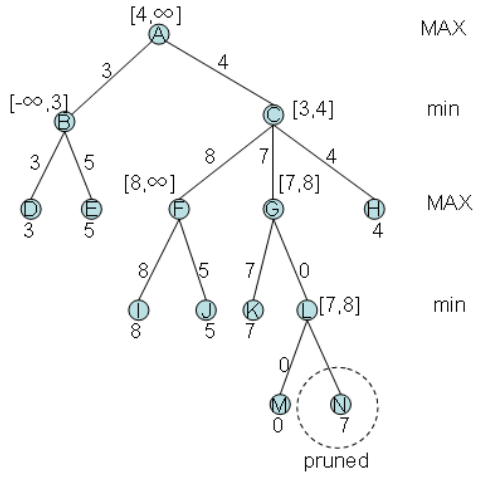


Figure 1: $\alpha - \beta$ pruning from left to right

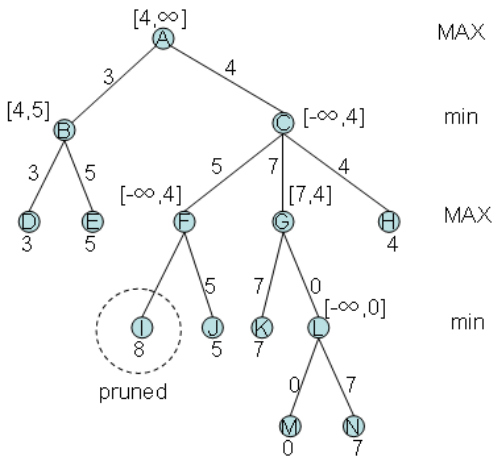


Figure 2: $\alpha - \beta$ pruning from right to left

node that are most likely to be the best, we may be able to prune more nodes.