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Engineering, Built Environment and IT
Department of Computer Science

COS 314

Tutorial/Practical 3

09 March 2023

Questions

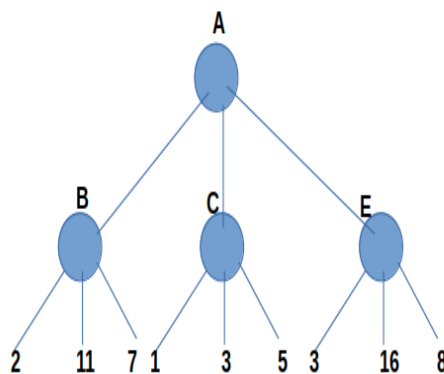


Figure 1:

- Given the diagram in Figure 1.
 - State the values of nodes A, B, C and E after applying the minimax algorithm if
 - Player **Max** plays first (i.e node A = Max layer) followed by **Min**.
 - Player **Min** plays first followed by **Max**.
 - State the optimal paths of the minimax algorithm for playing order 1 and 2 stated in a).
 - For each of the playing orders 1 and 2 state between which nodes may pruning occur (e.g node B and leaf 11) if at all, if alpha-beta pruning were to be applied.
- The given diagram in Figure 2 is a game tree for a game where MAX plays MIN. The players alternate with MAX playing first.
 - What is the maximum score MAX can obtain ?
 - Apply the minimax algorithm with alpha-beta pruning. Clearly state between which nodes pruning will occur if at all.

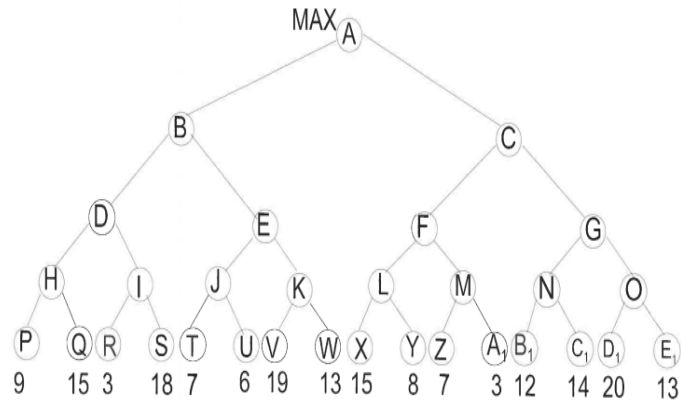


Figure 2:

3. Develop a program that models the tic-tac-toe game which allows a human player to play against the computer. The computer moves must be based on the minimax algorithm. The player and the computer alternate their moves and the computer must display the moves that were feasible after it has made its move before the human plays. The game must also offer the selection of who plays first.