

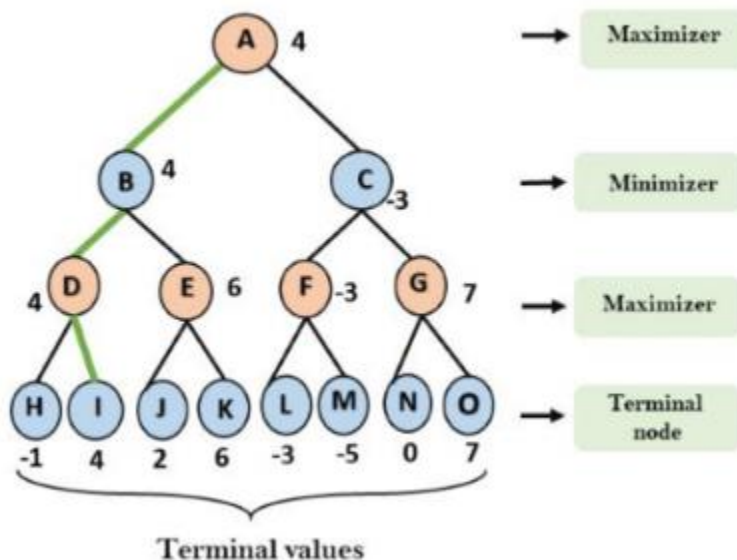
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Reg.no:220701031

### MINIMAX ALGORITHM

- A simple example can be used to explain how the minimax algorithm works. We've included an example of a game-tree below, which represents a two-player game.
- There are two players in this scenario, one named Maximizer and the other named Minimizer.
- Maximizer will strive for the highest possible score, while Minimizer will strive for the lowest possible score.
- Because this algorithm uses DFS, we must go all the way through the leaves to reach the terminal nodes in this game-tree.
- The terminal values are given at the terminal node, so we'll compare them and retrace the tree till we reach the original state.



## CODE:

```
def minimax(depth, nodeIndex, isMaximizingPlayer, scores, targetDepth):

    if depth == targetDepth:
        return scores[nodeIndex]

    if isMaximizingPlayer:
        return max(minimax(depth + 1, nodeIndex * 2, False, scores,
targetDepth),
                    minimax(depth + 1, nodeIndex * 2 + 1, False, scores,
targetDepth))
    else:

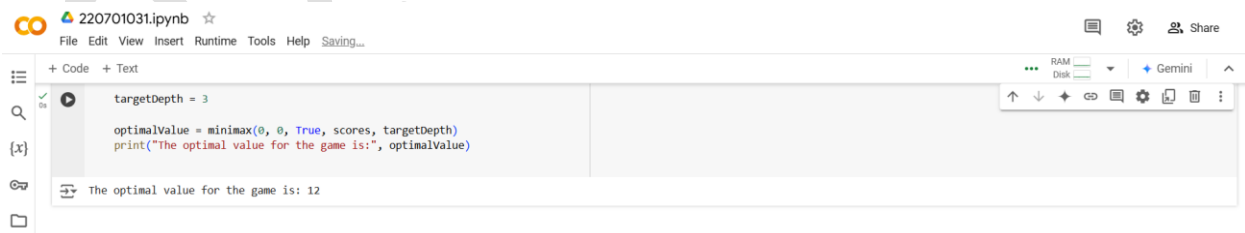
        return min(minimax(depth + 1, nodeIndex * 2, True, scores,
targetDepth),
                    minimax(depth + 1, nodeIndex * 2 + 1, True, scores,
targetDepth))

if __name__ == "__main__":
    scores = [3, 5, 2, 9, 12, 5, 23, 23]

    targetDepth = 3

    optimalValue = minimax(0, 0, True, scores, targetDepth)
    print("The optimal value for the game is:", optimalValue)
```

## OUTPUT:



The screenshot shows a Jupyter Notebook interface. At the top, the file name is '220701031.ipynb'. Below the file name is a menu bar with 'File', 'Edit', 'View', 'Insert', 'Runtime', 'Tools', 'Help', and 'Saving...'. On the right side of the menu bar are icons for chat, settings, and share. Below the menu bar is a toolbar with icons for code, text, search, and other functions. The main area of the notebook is divided into two sections: a code cell and an output cell. The code cell contains the same Python code as shown in the 'CODE' section. The output cell shows the result of the code execution: 'The optimal value for the game is: 12'.