

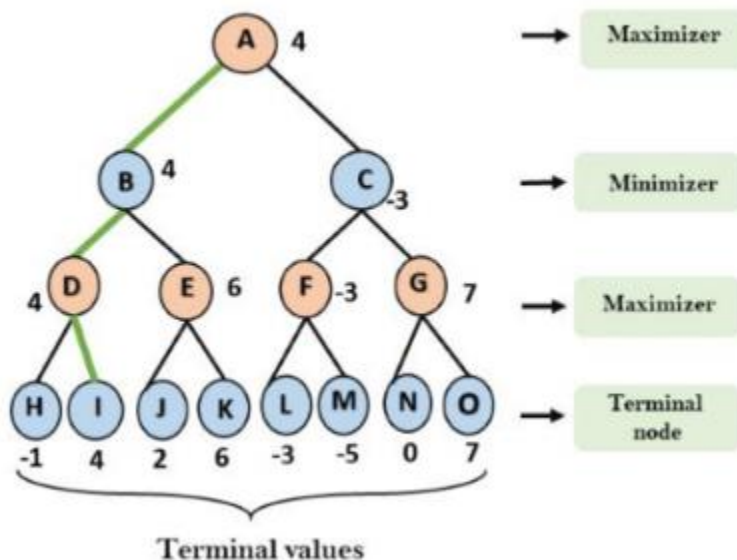
EX.NO:4

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Reg.no:220701902

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:

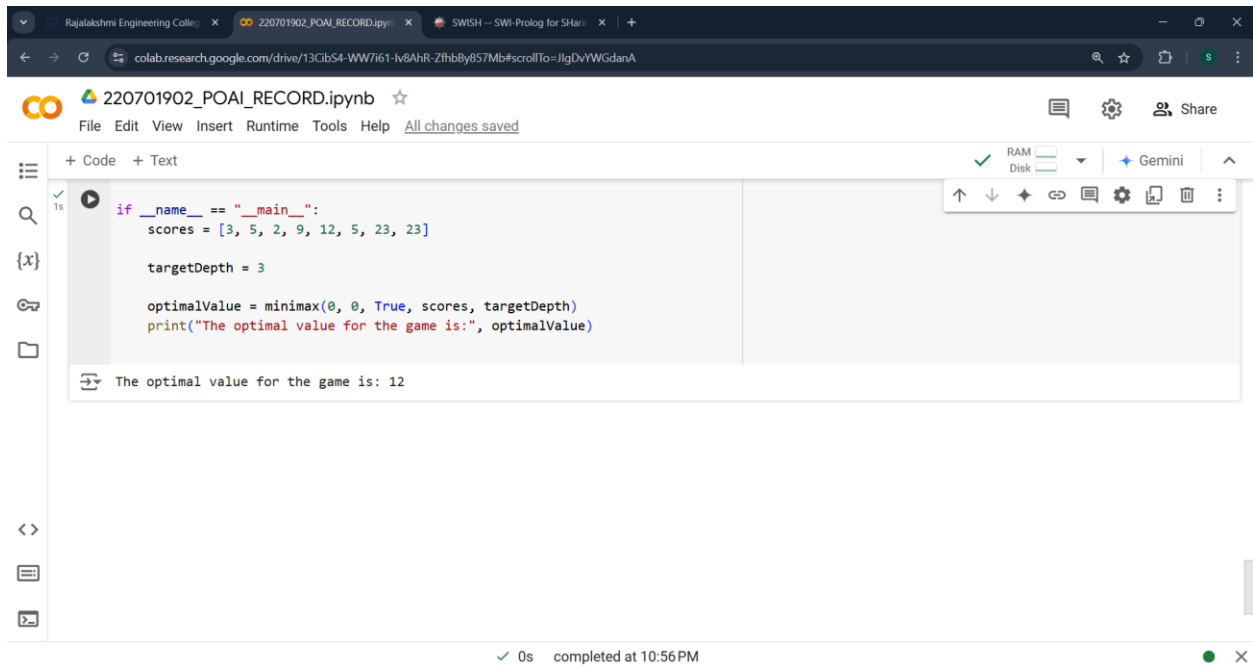
        return min(minimax(depth + 1, nodeIndex * 2, True, scores,
targetDepth),
                    minimax(depth + 1, nodeIndex * 2 + 1, True, scores,
targetDepth))

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 displays a Google Colab notebook interface. The browser's address bar shows the URL: `colab.research.google.com/drive/13GibS4-WW7i61-lv8AhR-ZfhbBy857Mb#scrollTo=JlgDvYWGdanA`. The notebook is titled `220701902_POAI_RECORD.ipynb`. The code cell contains the following Python code:

```
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)
```

The output of the code cell is displayed below the code: `The optimal value for the game is: 12`. The status bar at the bottom indicates that the execution completed successfully at 10:56 PM.