

## #Alphabeta\_pruning code :

```
def alphabeta(depth, index, alpha, beta, maximizingPlayer, values):
    # Base case: leaf node or depth limit reached
    if depth == 0 or index >= len(values):
        return values[index]

    if maximizingPlayer:
        best = float('-inf')
        # Left child
        val = alphabeta(depth-1, index*2, alpha, beta, False, values)
        best = max(best, val)
        alpha = max(alpha, best)
        if beta <= alpha:
            return best # prune

        # Right child
        val = alphabeta(depth-1, index*2 + 1, alpha, beta, False, values)
        best = max(best, val)
        alpha = max(alpha, best)
        return best

    else:
        best = float('inf')
        # Left child
        val = alphabeta(depth-1, index*2, alpha, beta, True, values)
        best = min(best, val)
        beta = min(beta, best)
        if beta <= alpha:
            return best # prune

        # Right child
        val = alphabeta(depth-1, index*2 + 1, alpha, beta, True, values)
        best = min(best, val)
        beta = min(beta, best)
        return best
```

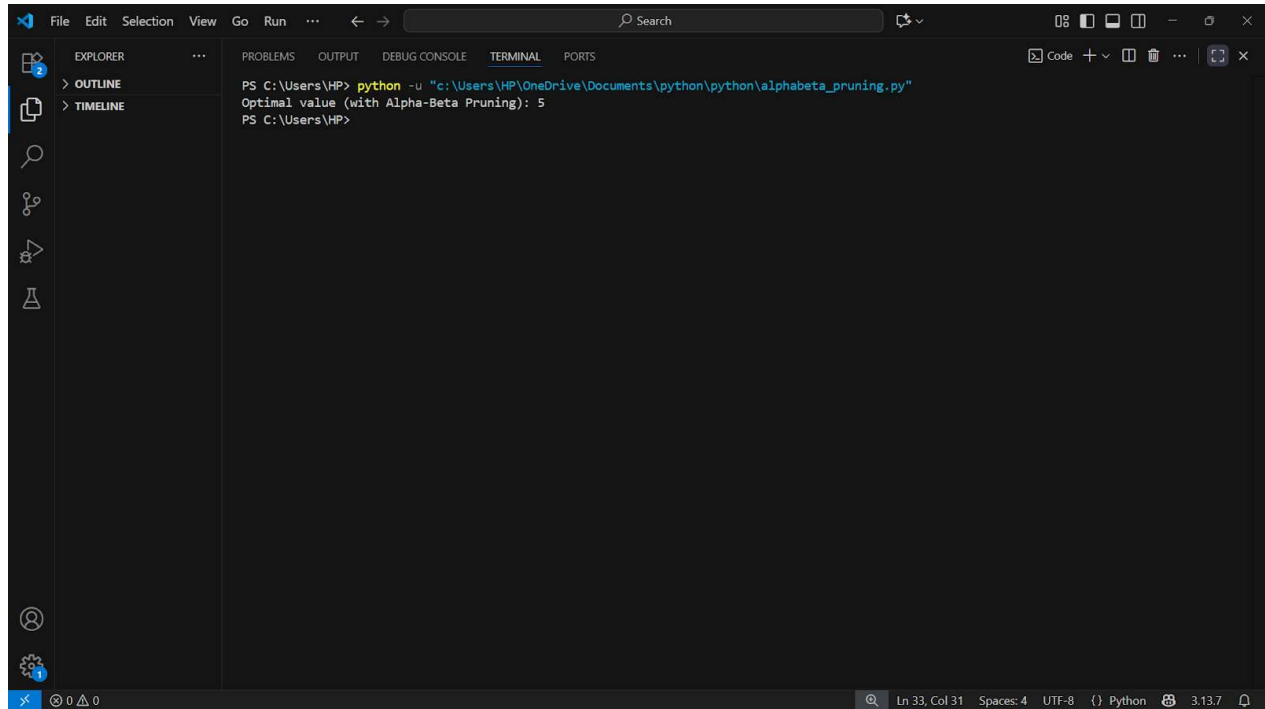
# Example leaf values

```
values = [3, 5, 6, 9, 1, 2, 0, -1]
```

```
depth = 3
```

```
result = alphabeta(depth, 0, float('-inf'), float('inf'), True, values)
```

```
print("Optimal value (with Alpha-Beta Pruning):", result)
```



The screenshot shows a Visual Studio Code interface with a terminal window open. The terminal displays the following output:

```
PS C:\Users\HP> python -u "c:\Users\HP\OneDrive\Documents\python\python\alphabeta_pruning.py"
Optimal value (with Alpha-Beta Pruning): 5
PS C:\Users\HP>
```

The terminal window is titled "TERMINAL" and is located at the bottom of the editor. The status bar at the bottom indicates the file is at line 33, column 31, with 4 spaces, using UTF-8 encoding, and the file type is Python.