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Batch B1

Assignment No. 4

Implementation of Min-Max Search Procedure with alpha beta for finding the solutions of games

Code:

```python
MAX, MIN = 1000, -1000
def minimax(depth, nodeIndex, maximizingPlayer,values, alpha, beta):
    if depth == 3:
        return values[nodeIndex]

    if maximizingPlayer:
        best = MIN
        for i in range(0, 2):
            val = minimax(depth + 1, nodeIndex * 2 + i,False, values, alpha, beta)

            best = max(best, val)
            alpha = max(alpha, best)
            # Alpha Beta Pruning
            if beta <= alpha:
                break
        return best

    else:
        best = MAX
        for i in range(0, 2):
            val = minimax(depth + 1, nodeIndex * 2 + i,True, values, alpha, beta)

            best = min(best, val)
            beta = min(beta, best)
            # Alpha Beta Pruning
            if beta <= alpha:
                break

        return best

if __name__ == "__main__":
    values = [3, 5, 6, 9, 1, 2, 0, -1]
    print("The optimal value \n->", minimax(0, 0, True, values, MIN, MAX))
```

Output:

```
C:\Users\ABEER\Desktop\Artificial_intelligence.py\intel
ligence\Assignment 4\MinMax.py"
The optimal value
-> 5
```