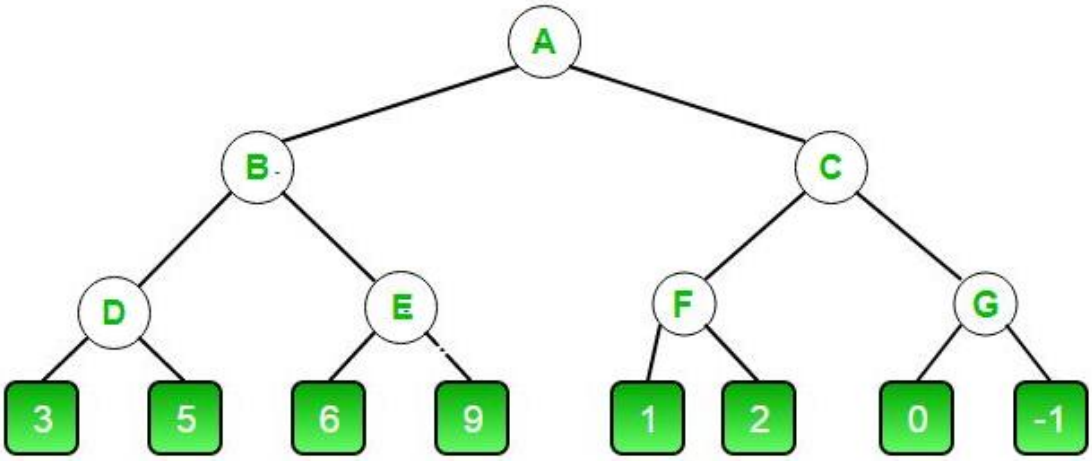
Task 4. Mini-max algorithm with Alpha-Beta Pruning in searching

Solve the following searching problem using Mini-max algorithm with Alpha-Beta Pruning approch.



Input Format:

Index of nodes and edges of problem graph.

Output Format:

Sequence of visited nodes of problem graph

Sample Code:

```
# Initial values of Alpha and Beta
MAX, MIN = 1000, -1000

# Returns optimal value for current player
#(Initially called for root and maximizer)
def minimax(depth, nodeIndex, maximizingPlayer,
                        values, alpha, beta):

    # Terminating condition. i.e
    # leaf node is reached
    if depth == 3:
        return values[nodeIndex]
```

```
if maximizingPlayer:

        best = MIN

        # Recur for left and right children
        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

        # Recur for left and
        # right children
        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

# Driver Code
if __name__ == "__main__":

    values = [3, 5, 6, 9, 1, 2, 0, -1]
    print("The optimal value is :", minimax(0, 0, True, values, MIN, MAX))
```

Sample Output:

The optimal value is : 5