Lab Programs

Program-01:

Question:

Implement Alpha Beta Pruning and trace the input tree manually(by yourself) and check the answer with the obtained Program output. Include tracing steps and program result along with the code.

Program Code:

```
max_val, mini_val=1000,-1000
def my_fun_alphabeta(depth,node_value,maxp,v,A,B):
  if depth==3:
   return v[node_value]
  if maxp:
   best =mini_val
   for i in range(0,2):
      value=my_fun_alphabeta(depth+1,node_value*2+i,False,v,A,B)
      best=max(best,value)
      A=max(A,best)
      if B<=A:
         break
   return best
  else:
   best=max_val
   for i in range(0,2):
     value=my_fun_alphabeta(depth+1,node_value*2+i,True,v,A,B)
     best=min(best,value)
     A=min(A,best)
     if B<=A:
         break
   return best
graph=[]
x= int(input("Enter total number of leaf node you want:"))
for i in range(x):
   y=int(input("Enter value of node"))
   graph.append(y)
depth=int(input("Depth value is:"))
node_value=int(input("Enter node value:"))
print("The final optimal value is:",my_fun_alphabeta(depth,node_value,True,graph,mini_val,max_val))
```

Final Results:

```
The final optimal value is: 5
PS C:\Users\nethr\OneDrive\Desktop\Skin canser Data>  c:; cd 'c:\Users\nethr\OneDrive\Desktop\Skin canser Data'; & 'C:\Users\nethr\AppData\Local\Programs\Python\Python311\python.exe' 'c:\Users\nethr\.vscode\extensions\ms-python.python-2023.14.0\pythonFiles\lib\python\debugpy\adapter/../..\debugpy\launcher' '51185' '--' 'c:\Users\nethr\OneDrive\Desktop\Skin canser Data\Program4.py'
Enter total number of leaf node you want:8
Enter value of node3
Enter value of node5
Enter value of node6
Enter value of node9
Enter value of node1
Enter value of node2
Enter value of node0
Enter value of node-1
Depth value is:0
Enter node value:0
The final optimal value is: 5
PS C:\Users\nethr\OneDrive\Desktop\Skin canser Data>
```

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```
PS C:\Users\nethr\OneDrive\Desktop\Skin canser Data>  & 'C:\Users\nethr\AppData\Local\Programs\Python\Python311\python.exe' 'c:\Users\nethr\.vscode\extensions\ms-python.python-2023.14.0\pythonFiles\lib\python\debugpy\adapter/../..\debugpy\launcher' '51896' '--' 'c:\Users\nethr\OneDrive\Desktop\Skin canser Data\Program4.py'
Enter total number of leaf node you want:8
Enter value of node3
Enter value of node5
Enter value of node2
Enter value of node9
Enter value of node1
Enter value of node4
Enter value of node7
Enter value of node6
Depth value is:0
Enter node value:0
The final optimal value is: 5
PS C:\Users\nethr\OneDrive\Desktop\Skin canser Data>
```

Trace: