import random

print("Input :")

id=input("1. Enter your student id: ")

value\_range=input("2. Minimum and Maximum value for the range of negative HP: ").split(' ')

rand\_start=int(value\_range[0])

rand\_end=int(value\_range[1])

turn=int(id[0])

brunch=int(id[2])

HP=int(id[7]+id[6])

row=(turn\*2)+1

table=[[]]

# creating table

# initially with column value 0

for i in range(row):

for j in range(brunch\*\*i):

table[i].append(0)

# removing extra row from table

if (i < row-1):

table.append([])

#putting random values in the last row

lastRow=len(table)-1

lastRowLength=len(table[lastRow])

for i in range(lastRowLength):

table[lastRow][i]=random.randint(rand\_start, rand\_end)

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#applying min-max

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level=lastRow

for i in range(turn\*2):

start=0

#if odd number then find min

#else find max

if((i+1)%2!=0):

for j in range(int((brunch\*\*level)/brunch)):

end=start+brunch-1

temp=table[level][start:end+1]

table[level-1][j]=min(temp)

start=end+1

else:

for j in range(int((brunch\*\*level)/brunch)):

end=start+brunch-1

temp=table[level][start:end+1]

table[level-1][j]=max(temp)

start=end+1

level=level-1

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# Leaf Node Comparisons calculation

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leaf\_nodes=table[lastRow]

alpha=min(leaf\_nodes[:brunch])

comparison=brunch

index=brunch

for i in range(int((len(leaf\_nodes)/brunch)-1)):

iterator=0

while iterator<brunch:

if alpha>leaf\_nodes[index]:

comparison=comparison+1

index=index+brunch-iterator

break

else:

comparison=comparison+1

index=index+1

iterator=iterator+1

if iterator==brunch:

start=(i+1)\*brunch

alpha=min(leaf\_nodes[start:index])

##################

# Output

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print()

depth=turn\*2

print("Depth and Branches ratio is ",depth,":",brunch)

print("Terminal States (leaf node values) are ",table[lastRow])

leftLife =(HP-table[0][0])

print("Left life(HP) of the defender after maximum damage caused by the attacker is ",leftLife)

print("After Alpha-Beta Pruning Leaf Node Comparisons",comparison)