# -\*- coding: utf-8 -\*-

"""Untitled0.ipynb

Automatically generated by Colaboratory.

Original file is located at

    https://colab.research.google.com/drive/1tkeGiDjSUOHVKgfT1QIQhUizwUhrYGZr

"""

import random

import math

def pruning(nodes,level):

    #print(level)

    newNodeSet = []

    if level == 0:

        return nodes[0]

    for a in range(0,len(nodes),2):

        if level%2==1:

            if nodes[a]<nodes[a+1]:

                newNodeSet.append(nodes[a+1])

            else:

                newNodeSet.append(nodes[a])

        else:

            if nodes[a]>=nodes[a+1]:

                newNodeSet.append(nodes[a+1])

            else:

                newNodeSet.append(nodes[a])

    #print(newNodeSet)

    return pruning(newNodeSet,level-1)

# TASK 1

# id = input("Enter ID: ")

id = "19241007"

for a in range(len(id)):

    if id[a]=="0":

        id  = id[:a] + "8" + id[a+1:]

#print(id)

start = int(id[5])

winScore = int(id[-2:][::-1])

end = int(winScore\*1.5)

#print(end)

terminalNodes = [random.randint(start,end) for randomNum in range(8)]

print("Generated 8 random points between the minimum and maximum point limits:",terminalNodes)

x = pruning(terminalNodes,int(math.log(len(terminalNodes),2)))

print("Total points to win:",winScore)

print("Achieved point by applying alpha-beta pruning =",x)

if x>winScore:

    print("Optimus Prime wins")

else:

    print("Megatron wins")

# TASK 2

print("After the shuffle:")

shuffleCount = int(id[3])

scores = []

for a in range(shuffleCount):

    scores.append(pruning([random.randint(start,end) for randomNum in range(8)],int(math.log(len(terminalNodes),2))))

print("List of all points values from each shuffle:",scores)

print("The maximum value of all shuffles:", max(scores))

winCount = 0

for b in scores:

    if b>winScore:

        winCount+=1

print("Won",winCount,"times out of",shuffleCount,"number of shuffles")