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                                ### Cogneau System Pvt. Ltd.

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                        # Ques = 02 => Weighing it a harder way

# Marks : 25

#27 coins out of which all are of 10g except 1 which is of 9g
# Approach => I would follow the divide and conquer, to get the
solution

#**********************************************************************
*****************
import math as mth

# Enter the number of coins and checking its validity that wether it
is power of 3 or not
while True:
    coins=int(input("Enter the total number of coins : "))
    isPowerOf3=int(mth.log(coins,3))
    if pow(3,isPowerOf3)==coins:
        break
    else:
        print("Enter a valid number of coins which is Power of 3")

# If the number of coins is power of 3 then only the loop breaks and
this part of code will run
# we here aim to return the minimum weighs we have to do i.e power of
3 which we have calculated above in "isPowerOf3" variable

print(f"\nThe minimum no of weighs that has to be done is :
{isPowerOf3}\n".title())
print(f"Description : We have to weight the coins {isPowerOf3} times
to get the defected or odd coin which is our requirement ")


#**********************************************************************
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Enter the total number of coins : 27

The Minimum No Of Weighs That Has To Be Done Is : 3

Description : We have to weight the coins 3 times to get the defected
or odd coin which is our requirement
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#                                   Ques = 03 => 1000 Wine

# Marks : 50

# Approach => I will follow the "BINARY ENCODING" method to find the
poisioned bottle


#*********************************************************************
************************************
import csv
# Pridicting which bottle is poisnous
print("\
n<<<<*************************************************************>>>>\
n")
print("****  Predict the poisoned bottle  ****")
print("\nEnter number of prisoner from 0,1,2,3......,9.\t Values must
be comma seprated\n")
dead=input("Enter the number of prisioner who is dead now : ")

s_predict=["0","0","0","0","0","0","0","0","0","0"]
for each in dead:
    if each==",":
        continue
    else:
        s_predict[9-int(each)]="1"

s1_predict="".join(s_predict)
poisonBottle=int(s1_predict,2)
if poisonBottle>1000:
    print("\nYou may entered wrong data about dead prisoner")
else:
    print(f"\nThe poisoned bottle is bottle number :  {poisonBottle}")
print("\
n<<<<*************************************************************>>>>"
)

#*********************************************************************
************************************

print("\n\
n<<<<*************************************************************>>>>\
n")
bag=[]
# Total Prisoners
prisoners=int(input("Enter the number of total prisoners : "))

# Total wine bottles
wine_bot=int(input("Enter number of wine bottles : "))
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# convert bottle no. to binary code and save in a list bag
for i in range(1,wine_bot+1):
    bin_conv=bin(i)[2:]
    if len(bin_conv)<=10:
        diff=10-len(bin_conv)
        bin_conv="0"*diff+bin_conv
        bag.append(bin_conv)


#print(bag)


# CSV data formation
#prisoner no 1,2,3,4...10
#bottle no. 54,34,21,34

# Columns of table
header=["BOTTLE No.", "PRISONER No."]

# Rows of table
data_rows=[]

for i in range(0,wine_bot):
    data=[]
    data.append(i+1)
    m=0
    for each in bag[i][::-1]:
        if each=="1":
            data.append(m+1)
        m=m+1
    data_rows.append(data)

    #print(data_rows)

with open('wine_person_detail.csv','w',newline='') as f:
    writer=csv.writer(f)
    writer.writerow(header)
    writer.writerows(data_rows)
print("CSV file created successfully ..........")
print("\nDescription : The first value represent the 'Bottle number'
and the remaining value is 'Person number' who drinks the wine from
bottle")

print("\
n<<<<************************************************************>>>>"
)
```

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#**********************************************************************
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<<<<************************************************************>>>>

****  Predict the poisoned bottle  ****

Enter number of prisoner from 0,1,2,3......,9.    Values must be comma
seprated

Enter the number of prisioner who is dead now : 10

The poisoned bottle is bottle number :  3

<<<<************************************************************>>>>


<<<<************************************************************>>>>

Enter the number of total prisoners : 10
Enter number of wine bottles : 1000
CSV file created successfully ..........

Description : The first value represent the 'Bottle number' and the
remaining value is 'Person number' who drinks the wine from bottle

<<<<************************************************************>>>>

#                                  ****  THE  END  ****
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