

Question 1

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In [ ]: import numpy as np
import math

y=np.random.randint(0,2,100)
ycap=np.random.rand(100)

O=0
for i in range(100):
    O=O+y[i]*math.log(ycap[i],2)+(1-y[i])*math.log(1-ycap[i],2)
O=-O/100

print(O)
```

Question 2

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In [ ]: class class1():
    def __init__(self,arr,target):
        self.target=target
        self.arr=arr

    def func1(self):
        list1=[]
        for i in range(n):
            for j in range(n):
                if (self.arr[i]+self.arr[j]==self.target):
                    list1.append([i,j])

        x=len(list1)
        dict1={}
        for i in range(x):
            dict1[i+1]=list1[i]
        print(dict1)

n=int(input("Enter number of elements in the array :"))
arr=[]
print("Enter the numbers :")
for i in range(n):
    arr.append(int(input()))

target=int(input("Enter the target number :"))

obj1=class1(arr,target)
obj1.func1()
```