INT108 Mini Project.

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Project Objective: To Develop a Program using Python programming language
                       which calculates distribution of a cake in N pieces. N
                       being an integer input from the User.

Snapshot of Problem:

Project 21: [Roll numbers:62,63,64]

Your task is to find if it is possible to cut the cake in the below mentioned ways for a given value of N.

Given an integer N and a cake which can be cut into pieces, each cut should be a straight line going from the center of the cake to its border. Also, the angle between any two cuts must be a positive integer. Two pieces are equal if their appropriate angles are equal.

The given cake can be cut in following three ways:

- Cut the cake into N equal pieces.
- Cut the cake into N pieces of any size.
- Cut the cake into N pieces such that no two of them are equal.

(Student is free to decide the input and output layout for this mini project)

Approach:

CASE 1   Only possible if 360 is divisible by N.

CASE 2   Only possible, if n is ≤ 360.

CASE 3   An ideal solution would be to choose pieces
           in such a way that the angles they form are 1, 2, 3, …
           respectively. So, in order for this case to be possible,
           (N * (N + 1)) / 2 must be ≤ 360.

Project Outcome: A program has been developed which takes the integer
                       input where it is determined whether the cake can be
                       divided in N equal, Random or Unequal pieces.

Cakeinator 1.3.py

```python
def cakeDiv(n):

 #case1
 #gives if n no. of equal pieces are possible

    if (360%n==0):
        print( n ,"Equal Pieces can be Cut")
    else:
        print (n ,"Equal Pieces cannot be Cut")

 #case2
 #gives if n no. of random pieces are possible

    if (n<=360):
        print (n ,"Random Pieces can be Cut")
    else:
        print (n ,"Random Pieces cannot be Cut")

 #case3
 #gives if n no. of unique pieces are possible

    if (((n * (n + 1)) / 2) <= 360):
        print (n ,"Unique Pieces can be Cut")
    else:
        print (n ,"Unique Pieces cannot be Cut")

N=int(input("Enter  number of pieces: "))
print(cakeDiv(N))


#initiating while loop to let the user exit the program or calculate with
another integer


while True:
    print("To End press enter")
    print("To Calculate for another cake, press Y")
    y=input()
    if y=="Y" or y=="y":
      N=int(input("Enter  number of pieces: "))
      print(cakeDiv(N))
    else:
        exit()
```

TEST CASES

Test Cases consist of N as integer inputs ranging selectively from 1-400.

Enter number of pieces: 1
1 Equal Pieces can be Cut
1 Random Pieces can be Cut
1 unique Pieces can be Cut
None
To End press enter
To Calculate for another cake, press Y
y
Enter number of pieces: 2
2 Equal Pieces can be Cut
2 Random Pieces can be Cut
2 unique Pieces can be Cut
None
To End press enter
To Calculate for another cake, press Y
y
Enter number of pieces: 3
3 Equal Pieces can be Cut
3 Random Pieces can be Cut
3 unique Pieces can be Cut
None
To End press enter
To Calculate for another cake, press Y
y
Enter number of pieces: 10
10 Equal Pieces can be Cut
10 Random Pieces can be Cut
10 unique Pieces can be Cut
None
To End press enter
To Calculate for another cake, press Y
y
Enter number of pieces: 100
100 Equal Pieces cannot be Cut
100 Random Pieces can be Cut
100 unique Pieces cannot be Cut
None
To End press enter
To Calculate for another cake, press Y
y
Enter number of pieces: 180
180 Equal Pieces can be Cut
180 Random Pieces can be Cut
180 unique Pieces cannot be Cut
None
To End press enter
To Calculate for another cake, press Y
y
Enter number of pieces: 270
270 Equal Pieces cannot be Cut
270 Random Pieces can be Cut

270 unique Pieces cannot be Cut
None
To End press enter
To Calculate for another cake, press Y
y
Enter number of pieces: 360
360 Equal Pieces can be Cut
360 Random Pieces can be Cut
360 unique Pieces cannot be Cut
None
To End press enter
To Calculate for another cake, press Y
y
Enter number of pieces: 390
390 Equal Pieces cannot be Cut
390 Random Pieces cannot be Cut
390 unique Pieces cannot be Cut
None
To End press enter
To Calculate for another cake, press Y
y
Enter number of pieces: 400
400 Equal Pieces cannot be Cut
400 Random Pieces cannot be Cut
400 unique Pieces cannot be Cut
None
To End press enter
To Calculate for another cake, press Y