**Problem statement 1:-**

It is Edward's birthday today. His friends have bought him a huge **circular** cake. Edward wants to find out the maximum number of pieces he can get by making exactly N straight vertical cuts on the cake.

Your task is to write a function that returns the maximum number of pieces that can be obtained by making N number of cuts.

Note: Since the answer can be quite large, modulo it by 1000000007

**Input Specification:**

input1: An integer N denoting the number of cuts

**Output Specification:**

Return the maximum number of pieces that can be obtained by making N cuts on the cake

**Input Output Explanation 1:**

1

2

Given the above scenario, if we make 1 cut on the cake, the maximum number of pieces of cake we obtain is 2 and 2%1000000007=2. Hence, 2 is returned as output.

**Input Output Explanation 2:**

5

16

Given the above scenario, if we make 5 cuts on the cake, the maximum number of pieces of cake we obtain is 16 and 16% 1000000007=16. Hence, 16 is returned as output.

**Problem statement 2:-**

Mr. Professor is a great scientist, but he is not able to find a solution to one problem. There are N straight lines that are not parallel, and no three lines go through the same point. The lines divide the plane into M regions. Write a function to find out the maximum number of such regions he can get on the plane.

**Input Specification:**

input1: An integer N representing the number of straight lines (0 <=N<= 100)

**Output Specification:**

Return the maximum number of regions

**Input Output Explanation-1:**

2

4

Given the above scenario, 2 lines divide the plane into 4 regions. Therefore, 4 is returned as the output.

**Input Output Explanation-2:**

3

7

Given the above scenario, 3 lines divide the plane into 7 regions. Therefore, 7 is returned as the output.

**Problem Statement 3:-**

Write a function to check whether the given number is a perfect number or not. The function should returns true if the number is a perfect number, else it should returns false.  
  
Hint: Perfect number is a positive whole number that is equal to the sum of its proper divisors.  
The first perfect number is 6 as the sum of its proper positive divisors, 1,2 and 3 is 6. Other perfect numbers are 28, 496, 8128 ...  
  
Extend the program written for the above problem to write another function to find all perfect numbers in a given list of numbers. Populate the perfect numbers in a list and return the list. If no perfect numbers found, return an empty list.