1. Please write a function **int gcd(int a, int b)** to compute the gcd of a and b. In this problem you are required to output the gcd of a set of number. Please write a main program to let user continuously input the number in the set and stop when input data is Ctrl+Z or Ctrl+D.

   Example: 72 96 24 66 6 18 12 30 60 48 -> 6

   2147483647 1 2147483647 2147483647 2147483647 -> 1

2. There are N boxes with balls in them. All the balls have different colors so they are distinguishable. First box has M balls, 2nd box has M+1 balls, 3rd box has M+2 balls and so on. So Nth box have N + M - 1 balls. You choose one of the N boxes and take M balls from this. How many numbers of ways are there to do it? For each test case input two integers N, M and output the result. Program stops when input data is Ctrl+Z or Ctrl+D.

   In this problem, you will need to write the function **int C(int n, int k)** that has two parameters n and k of type int. The function returns the result of the equation:

   $$C_k^n = \frac{n!}{(n-k)!k!}$$

   Note that, with the formula C(m,k+1)+C(m,k)=C(m+1,k+1) you can complete the main program without for-loop.

   Example: 9 9 -> 43758

3. Write a function **int powmod(int n, int k, int m)** to compute n^k % m. For k is very big, you can't multiple k times to complete it. Following is the algorithm:

a = b * c -> a % k = ((b % k) * (c % k)) % k

a^2 % k = ((a % k) * (a % k)) % k

a^4 % k = ((a^2 % k)*(a^2 % k)) % k

a^8 % k =......

$111_{dec} = 1101111_{bin}$

13^{111} % 113 = (13^{64} * 13^{32} * 13^8 * 13^4 * 13^2 * 13^1) % 113

= ((13^{64} %113)*(13^{32} %113)*(13^8 %113)*(13^4 %113)*

(13^2 %113)*(13^1 %113)) % 113

Every multiplication must follow by modulo to avoid overflow.

For each test case input three integer n, k, m, and output the result. Program stops when input data is Ctrl+Z or Ctrl+D.

Example: 13 112111 113 -> 87

13 1008112111 113 -> 87