Sanvi and Magical Numbers

Let us define a **Magical number** as a positive integer number which meets the following criteria on its representation:

> 1.) It does not contain any zeros.
>
> 2.) Each digits may appears at most twice in it.
>
> 3.) The absolute differences between summation of count of non-prime digits and count of prime-digits do not exceed K.

Sanvi likes numbers which are not prime. So, **she wants to allow at most M non prime numbers to violate the rule number-2** . Sanvi also uses following algorithm in rule number-3 to calculate count of each digit **d** in a number:

> count(d) = min(total occurrences of d in number, 2)

You are given an integer number **N**. Your task is to find the total Magical numbers in the range from **1** to **N** following Sanvi's command. Since the answer could be very large, print it modulo **10^9+7**.

Input

Input contains several test cases up to **EOF** (End Of File), which contains three space separated integers **N (1 ≤ N ≤ 10^18) , K(0≤ K≤ 18) and M(0 ≤ M ≤ 5)** as described in the problem statement.Total test cases will not exceed **5**.

Output

Output a single integer denoting the total Magical numbers from **1 to N following Sanvi's command** . Since the answer could be very large print it modulo **10^9+7**.

Example

Input:

10 1 0
5 3 2

Output:

9
5