# Project Euler #231: The prime factorisation of binomial coefficients

This problem is a programming version of Problem 231 from projecteuler.net

For a positive integer $n = \prod_{i=1}^{r} p_i^{\alpha_i}$ where $p_i$ are distinct primes, define $\omega(n) = \sum_{i=1}^{r} \alpha_i$.

For example, $\omega(1) = 0$, $\omega(9) = 2$ and $\omega(12) = 3$.

Let

$$f(N, M, k) = \sum_{\substack{d \mid \binom{N}{M} \\ \omega(d) = k}} d$$

That is, $f(N, M, k)$ is the sum of all positive divisors $d$ of the binomial coefficient $\binom{N}{M}$ satisfying $\omega(d) = k$.
Given $N$, $M$ and $K$, find $f(N, M, k)$ modulo $1004535809$, for all $1 \leq k \leq K$.

### Input Format

The only line of each test file contains three space-separated integers: $N$, $M$ and $K$.

### Constraints

- $1 \leq M \leq N \leq 10^9$.
- $1 \leq K \leq 15$.

### Output Format

Print exactly $K$ lines, the $i$-th line must contain the answer when $k = i$.

### Sample Input 0

```
15 9 3
```

### Sample Output 0

```
36
466
2556
```

### Explanation 0

$\binom{15}{9} = 5 \cdot 7 \cdot 11 \cdot 13 = 5005$.

- $k=1$: $5+7+11+13=36$.
- $k=2$: $35+55+65+77+91+143=466$.
- $k=3$: $385+455+715+1001=2556$.

### Sample Input 1

```
16 3 1
```

### Sample Output 1

```
14
```

### Explanation 1

$\binom{16}{3}=2^4\cdot 5\cdot 7=560$.

- $k=1$: the answer is $2+5+7=14$.

### Sample Input 2

```
22 6 4
```

### Sample Output 2

```
57
1210
11730
50629
```

### Explanation 2

$\binom{22}{6}=3\cdot 7\cdot 11\cdot 17\cdot 19=74613$.

- $k=1$: $3+7+11+17+19=57$.
- $k=2$: $21+33+51+57+77+119+133+187+209+323=1210$.
- $k=3$: $231+357+399+561+627+969+1309+1463+2261+3553=11730$.
- $k=4$: $3927+4389+6783+10659+24871=50629$.