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The Simplest Sum



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You are just learning to code and are finished with loops and functions. Now, you are given the following pseudocode:

```
/*
 * The function has two integer parameters: k and n
 * The function returns the value of sum
 */
function f(k, n) {
    sum = 0;

    for (i = 1; i ≤ n; i += 1) {
        sum += i;
        i *= k;
    }

    return sum;
}
```

For three given integers k , a , and b , find the value of $S \bmod (10^9 + 7)$, where S is defined as:

$$S = \sum_{n=a}^b f(k, n)$$

Input Format

The first line of the input is an integer Q , the total number of queries. Each of the next Q lines contains three space separated integers k , a , and b .

Constraints

- $1 \leq Q \leq 10^5$
- $2 \leq k \leq 10^5$
- $1 \leq a \leq b \leq 10^{18}$

Output Format

For each query, print the value of $S \bmod (10^9 + 7)$ on a new line.

Sample Input

```
4
2 1 5
3 1 5
4 1 5
5 1 5
```

Sample Output

```
14
13
10
5
```

Explanation

- Query 2 1 5

$$\begin{aligned}f(2,1) &= 1 \\f(2,2) &= 1 \\f(2,3) &= 4 \\f(2,4) &= 4 \\f(2,5) &= 4\end{aligned}$$

$$\text{So, } S = f(2,1) + f(2,2) + f(2,3) + f(2,4) + f(2,5) = 1 + 1 + 4 + 4 + 4 = 14$$

- Query 3 1 5

$$\begin{aligned}f(3,1) &= 1 \\f(3,2) &= 1 \\f(3,3) &= 1 \\f(3,4) &= 5 \\f(3,5) &= 5\end{aligned}$$

$$\text{So, } S = f(3,1) + f(3,2) + f(3,3) + f(3,4) + f(3,5) = 1 + 1 + 1 + 5 + 5 = 13$$

- Query 4 1 5

$$\begin{aligned}f(4,1) &= 1 \\f(4,2) &= 1 \\f(4,3) &= 1 \\f(4,4) &= 1 \\f(4,5) &= 6\end{aligned}$$

$$\text{So, } S = f(4,1) + f(4,2) + f(4,3) + f(4,4) + f(4,5) = 1 + 1 + 1 + 1 + 6 = 10$$

- Query 5 1 5

$$\begin{aligned}f(5,1) &= 1 \\f(5,2) &= 1 \\f(5,3) &= 1 \\f(5,4) &= 1 \\f(5,5) &= 1\end{aligned}$$

$$\text{So, } S = f(5,1) + f(5,2) + f(5,3) + f(5,4) + f(5,5) = 1 + 1 + 1 + 1 + 1 = 5$$

Contest ends in a day

Medium

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Python 3   

```
1 #!/bin/python3
2
3 import sys
4
5 def simplestSum(k, a, b):
6     # Complete this function
7
8 if __name__ == "__main__":
9     q = int(input().strip())
10    for a0 in range(q):
11        k, a, b = input().strip().split(' ')
12        k, a, b = [int(k), int(a), int(b)]
13        result = simplestSum(k, a, b)
14        print(result)
15
```

Line: 1 Col: 1

 [Upload Code as File](#)☐ Test against custom input

Run Code

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