

NT Games

Katniss Everdeen after participating in Hunger Games now wants to participate in NT Games (Number Theory Games).

As she begins President Snow provides her a number k . Then, she has to defend t back to back attacks from Haymitch Abernathy for practice. In each attack Haymitch Abernathy gives two numbers l and r , for defense she has to compute :

$$\left(\sum_{j=l}^r \left(\sum_{i=1}^j (\gcd(i, j))^k \right) \right) \% (10^9 + 7)$$

As she is new to number theory, help her by computing given expression.

Input Format

First line contain an integer, i.e. k .

Second line contain an integer, i.e. t .

Each of next t lines contain two integers, i.e. l & r .

Constraints

$$1 \leq k \leq 10^5$$

$$1 \leq t \leq 10^5$$

$$1 \leq l \leq 10^5$$

$$l \leq r \leq 10^5$$

Output Format

For each attack output the value of expression.

Sample Input

1

1

1 5

Sample Output

26

Explanation : Just evaluate the expression.

