

Common_Divisors_queries

question

- Given N, Q queries, you will be given a number K you have to find count of common divisors of N and K
- $N < 1e12$, $k < 1e12$, $q < 5e5$

$O(Q * \log(n))$

bad approach

- Step 1: Calculate GCD between N and K, let it be G
- Step 2: find Number of divisors of G
- Complexity per query: $O(\log N + \sqrt{G})$

good approach

- number of primes factors of number doesn't exceed $\log(\text{number})$
1. we obtain prime fact for N
 - ex : 1800 -> (2,3) (3,2) (5,2)
 2. we use the primes of N only to prime fact K
 - ex : k = 200 -> using (2,3,5) "عدددهم اخرة" $\log(n)$ 200 -> (2,3) (3,0) (5,2)
 3. using the number of divisors rule the ans is $(3+1) * (0+1) * (2+1) = 12$

Divisors / multiplier_queries

question

- Given N, Q queries, you will be given a number K you have to find count of divisors of N that is multiple of K
- last question we got count of divisors of N that is also divisor of K
- $N < 1e12$, $k < 1e12$, $q < 5e5$

approach

- the prime factors of K they appear in any multiple of it " the lower bound "
- the prime factors of N is " the upper bound "