

Assessment- 1 [Last Zero]

Editorial by Joydeep Biswas

Difficulty:- Easy

Prerequisites:- Factorial , Prime factor(basic)

Problem Understanding:- There is an integer number N. we have to calculate the trailing zeros of its factorial. i.e we have to count the number of zeros at the end of the number. So, when we calculate factorial of a number N by multiplying all the number from 1 to N, factorial of N will be $\text{factorial}(N) = N * (N-1) * (N-2) * (N-3) * (N-4) * \dots * 1$.

Solution Approach:-

General approach for very small number(N):-

The naïve approach we can follow that simply calculate the factorial of N and then count the ending zeros repeatedly mod the integer number by 10 (to get last digit) and divide the integer number by 10 (to eliminate last digit) until it become 0.

But if we follow this approach then it will generate a very very huge number which can't be stored because the constraints for N is 10^9 .

Actual approach for 100 point:-

So, for this problem we have to consider the prime factors of factorial N. We just have to calculate the number of two prime factors(2 and 5) for which the trailing zero's are generated.

Super-duper very quick explanation:-

So, in order to count the number of pair (2 & 5) in factor of factorial N. we just have to count the number of 5s in factorial N by dividing the number each time by power of 5 till the result is greater or equal to 1 & add those result of division. i.e divide N with 5^1 , 5^2 , 5^3while $N/1 \geq 1$ and sum up those results.

Full Explanation:-

Credit GeeksforGeeks

<https://www.geeksforgeeks.org/count-trailing-zeroes-factorial-number/>

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Code:-

```
//  
// by Joydeep Biswas - 18/04/2020  
//  
//solution for 100 Points  
//  
import java.io.BufferedReader;  
import java.io.InputStreamReader;  
  
import java.util.*;  
  
class TestClass {  
    public static void main(String args[] ) throws Exception {  
  
        BufferedReader br = new BufferedReader(new  
InputStreamReader(System.in));  
        int t = Integer.parseInt(br.readLine());  
        while(t-->0){  
            long n = Long.parseLong(br.readLine());  
            long numberOfZero=0;  
            long i=5;  
            while(n/i>=1){  
                numberOfZero+=n/i;  
                i*=5;  
            }  
            System.out.println(numberOfZero);  
        }  
    }  
}
```