### PROBLEM SOLVING

# LeetCode 172. Factorial Trailing Zeroes ~ Intuition & Solution



https://leetcode.com/problems/factorial-trailing-zeroes/

Based on this intuition, try solving on our own before looking at the code.

How can we tell from a number, how many trailing zeroes are at the end?

```
10 = 10
1200 = 12 \times 10 \times 10
145000 = 145 \times 10 \times 10 \times 10
```

From above example, we can clearly see number of 10's in a number gives us number of trailing zero in that number.

10's are in there. That will give us the solution.

So, in our first brute force solution we can calculate the n! and check how many

But, since for any smaller value of n, n! will become very very large to calculate. So, this is not a feasible solution.

What can we do?

Let's build some more intuition to see if we can find out the final hint we need, to solve this question.

What is the property of 10?

We can get 10 from 2 & 5 (2x5). Can you get 10 in any other way? No.

So, let's break it down further.

```
10 = 2 \times 5 [1(2),1(5)]
100 = 2 \times 2 \times 5 \times 5 [2(2),2(5)]
120 = 2 \times 2 \times 2 \times 3 \times 5 [3(2),1(3),1(5)]
1200 = 2 \times 2 \times 2 \times 2 \times 3 \times 5 \times 5 [4(2),1(3),2(5)] //2 \text{ appears 4 times, 3 appears 1}
time, 5 appears 2 times}
50 = 2 \times 5 \times 5 [1(2), 2(5)]
```

From above you will see, among 5 and 2 whichever appears lowest amount is the count of our trailing zeros.

But for n!, we know we will have more 2's than 5. Let's see an example:  $5! = 1 \times 2 \times 3 \times 4(2 \times 2) \times 5 = [3(2),1(5)]$ 

Try writing down couple more example and you will understand. So, in 25! how many 5 will be there?

....x5....x10....x15....x20....x25 = x5...x2x5....x3x5....x4x5....x5x5 = 6, Because 25 itself has 2 5's in it.

Ok, up till this point we were still calculating n!.

But we know if n is bigger than 5 it will have 5 as a factor.

```
If n=5 ... there will be 1(5)
If n=10 ... there will be 2(5)
If n=15 ... there will be 3(5)
```

If n=25 ... there will be 5(5) + 1(5)

So, based on our intuition so far.

result until n get to o.

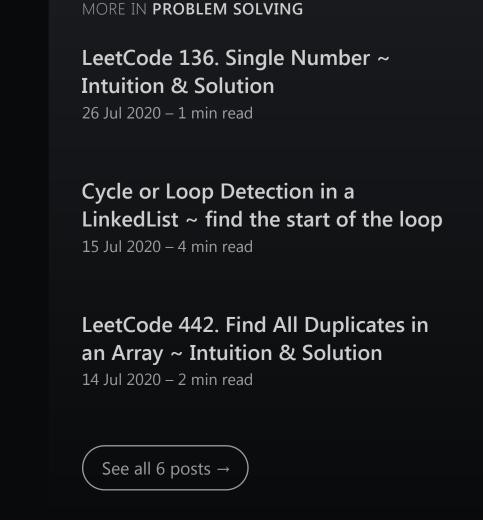
Now all we need to do is keep dividing n by 5 and add the result to our existing

If you are still having problem here is the code snippet for the problem.

public int trailingZeroes(int n) {

**Solution**[Java]:

```
int result = 0;
while(n!=0){
    result += n/5;
    n = n/5;
return result;
```



https://leetcode.com/problems/first-

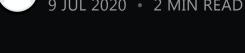
**PROBLEM SOLVING** 

## missing-positive/ Based on this intuition, try solving on our own before looking at the

Positive ~ Intuition & Solution

LeetCode 41. First Missing

code.If we have an array of length n we know "smallest missing positive integer" must be in between 1 and n+1(inclusive). For example: **NEXT SWE** 9 JUL 2020 • 2 MIN READ



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## I have read so far. Checkout(Affiliate Links):

Just wanted give a quick update on my regular study. I have been reading DS/Algo book by Goodrich/Tamassia for quite sometime now. This is turning out to **NEXT SWE** 

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```