

172 Factorial Trailing Zeroes

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Question:

Given an integer n , return the number of trailing zeroes in $n!$.

Note: Your solution should be in logarithmic time complexity.

来自 <<https://leetcode.com/problems/factorial-trailing-zeroes/description/>>

给定一个整数 n ，返回 $n!$ 结果尾数中零的数量。

注意：你的解决方案应为对数时间复杂度。

Solution for Python3:

```
1  class Solution1:
2      def trailingZeroes(self, n):
3          """
4          :type n: int
5          :rtype: int
6          """
7          i = 1
8          r = 0
9          while 5**i <= n:
10             r += n // 5**i
11             i += 1
12         return r
13
14     # Because all trailing 0 is from factors 5 * 2.
15     # But sometimes one number may have several 5 factors.
16     # for example, 25 have two 5 factors, 125 have three 5 factors.
17     # In the n! operation, factors 2 is always ample.
18     # So we just count how many 5 factors in all number from 1 to n.
19     class Solution2:
20         def trailingZeroes(self, n):
21             """
22             :type n: int
23             :rtype: int
24             """
25             return 0 if n == 0 else n // 5 + self.trailingZeroes(n // 5)
26
27     class Solution3:
28         def trailingZeroes(self, n):
29             """
30             :type n: int
31             :rtype: int
32             """
33             r = 0
34             while n:
35                 r += n // 5
36                 n //= 5
```

Solution for C++:

```
1  class Solution1 {
2  public:
3      int trailingZeroes(int n) {
4          int i = 1, r = 0;
5          while (pow(5,i) <= n) {
6              r += n / pow(5,i++);
7          }
8          return r;
9      }
10 };
11
12 class Solution2 {
13 public:
14     int trailingZeroes(int n) {
15         return n == 0 ? 0 : n / 5 + trailingZeroes(n / 5);
16     }
17 };
18
19 class Solution3 {
20 public:
21     int trailingZeroes(int n) {
22         int r = 0;
23         while (n) {
24             r += n / 5;
25             n /= 5;
26         }
27         return r;
28     }
29 };
```