

258. Add Digits

Given an integer num, repeatedly add all its digits until the result has only one digit, and return it.

Ex 1: Input: num = 38

Outputs: 2

Explanation: The process is

$$38 \rightarrow 3 + 8 \rightarrow 11$$

$$11 \rightarrow 1 + 1 \rightarrow 2$$

Since 2 has only one digit, return 2

* Tips:

Let's say we have a number 235

$$\begin{array}{ccc} 2 & 3 & 5 \\ \downarrow & \downarrow & \downarrow \\ d_2 & d_1 & d_0 \end{array} \quad \begin{aligned} &= d_0 + d_1 \cdot 10 + d_2 \cdot 100 \\ &= d_0 + d_1(9 \cdot 1 + 1) + d_2(9 \cdot 11 + 1) \\ &= d_0 + d_1 + d_2 + \underbrace{9(d_1 \cdot 1 + d_2 \cdot 11)}_{\text{divisible by 9}} \end{aligned}$$

⇒ Any number can be written in the form of $\boxed{a + 9b}$ where

a is the sum of its digit

Solution:

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def addDigits(num)
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    if num == 0:
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```
        return 0
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    else:
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```
        return 9 if num % 9 == 0 else num % 9
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