

## Documentation for the "Plus One" Problem

### Problem Description

You are given a large integer represented as an array of digits. Each element of the array digits represents a single digit of the integer, ordered from most significant to least significant in lefttoright order. The large integer does not contain any leading zeros.

The task is to increment this large integer by one and return the resulting array of digits.

### Examples

#### Example 1:

- *Input:* digits = [1,2,3]
- *Output:* [1,2,4]
- *Explanation:* The array represents the integer 123. Incrementing by one gives  $123 + 1 = 124$ . Thus, the result should be [1,2,4].

#### Example 2:

- *Input:* digits = [4,3,2,1]
- *Output:* [4,3,2,2]
- *Explanation:* The array represents the integer 4321. Incrementing by one gives  $4321 + 1 = 4322$ . Thus, the result should be [4,3,2,2].

### Example 3:

- *Input:* digits = [9]
- *Output:* [1,0]
- *Explanation:* The array represents the integer 9. Incrementing by one gives  $9 + 1 = 10$ . Thus, the result should be [1,0].

### Constraints

- $1 \leq \text{digits.length} \leq 100$
- $0 \leq \text{digits}[i] \leq 9$
- The array digits does not contain any leading zeros.

### Solution Explanation

- The provided solution is implemented in Python within a class called Solution. The plusOne method takes a list of integers (digits) as input and returns a list of integers representing the incremented value.

### Explanation of the Code

1. Initialization: The variable n is set to the length of the digits list.
2. Traverse from Right to Left:
  - The loop starts from the last element (rightmost) and moves towards the first element (leftmost).
  - For each digit, the code checks if it is less than 9.
  - If the current digit is less than 9, it is incremented by 1 and the modified list digits is returned immediately.
  - If the current digit is 9, it is set to 0 because adding 1 to 9 results in a carryover, and the loop continues to the next digit to the left.

### 3. Handle All Nines:

- If the loop completes without returning (i.e., all digits were 9), a new list [1] + digits is returned. This handles cases where the entire number consists of nines (e.g., 999 becomes 1000).

### Example Usage

- The example usage shows how to create an instance of the Solution class and call the plusOne method with different input arrays, demonstrating the expected outputs.

python

```
sol = Solution()
```

```
print(sol.plusOne([1,2,3])) Output: [1,2,4]
```

```
print(sol.plusOne([4,3,2,1])) Output: [4,3,2,2]
```

```
print(sol.plusOne([9])) Output: [1,0]
```