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Intuition

The plusOne method in the Solution class is designed to take a list of digits representing a non-negative integer and increment it by 1. The implementation uses a loop that iterates through the digits in reverse order, starting from the least significant digit.

The loop checks each digit, and if it is equal to 9, it sets it to 0, effectively carrying over the increment to the next more significant digit. This process continues until a digit is encountered that is not equal to 9. In that case, the digit is incremented by 1, and the modified list is immediately returned.

If the loop completes without encountering a digit that is not 9, it means all digits were 9, and the method returns a new list with a single element, 1, appended to the beginning of the original list. This accounts for the case where the original number was composed entirely of 9s, and adding 1 results in an additional digit.

Approach

1. **Iterate in Reverse**: The algorithm iterates through the input list of digits in reverse order, starting from the least significant digit. This is done using a `for` loop with the range set to `len(digits)-1` to 0, moving from the last digit to the first.
2. **Check for 9s and Increment**: Inside the loop, each digit is checked. If the digit is 9, it is set to 0 to simulate the carryover. If the digit is not 9, it is incremented by 1, and the modified list is immediately returned. This process ensures that the increment is carried over if needed.
3. **Handling All 9s Case**: If the loop completes without encountering a digit that is not 9, it means all digits were 9. In this case, a new list is returned with a single element, 1, appended to the beginning of the original list. This step accounts for the scenario where adding 1 results in an additional digit.
4. **Final Result**: The final result is a list representing the incremented number.

Complexity

- Time complexity: O(n)

- Space complexity: O(1)

Code

```
class Solution:
    def plusOne(self, digits: List[int]) -> List[int]:
        for i in range(len(digits)-1, -1, -1):
            if digits[i] == 9:
                digits[i] = 0
            else:
                digits[i] = digits[i] + 1
                return digits
        return [1] + digits
```

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