MIVA
OPEN UNIVERSITY

Technical Test

1. Plus One

You are given a large integer represented as an integer array digits, where each digits[i] is the i^{th} digit of the integer. The digits are ordered from most significant to least significant in left-to-right order. The large integer does not contain any leading 0's.

Increment the 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 < = digits.length < = 100
0 < = digits[i] < = 9
digits does not contain any leading 0's.

2. Alternate Min-Max Rearrangement

Modify a given array of integers so that the first element is the smallest, the second is the largest, the third is the second-smallest, the fourth is the second-largest, and so on.

Constraints:
The input variable arr is a list of integers.
The length of arr can be any non-negative integer.
The elements in arr can be positive, negative, or zero.
There are no specific constraints on the range of values for the elements in arr.

Test cases:

Test Case #1
Input: [13, 7, 8, 3, 2, 10, 15, -1]
Output: [-1, 15, 2, 13, 3, 10, 7, 8]
Description: This test case has a mix of positive and negative integers which tests the function's ability to sort and interleave them according to the problem""s requirements.

Test Case #2
Input: [-5, -12, -1, 7, 14, -7, 3, 6]

Output: [-12, 14, -7, 7, -5, 6, -1, 3]
Description: This case with both negative and positive integers challenges the algorithm to handle interleaving in a more complex array with negative values.

Test Case #3
Input: [3, 6, 9, -10, -5, -2, 0, 8]
Output: [-10, 9, -5, 8, -2, 6, 0, 3]
Description: This test case includes negative numbers, positive numbers, and a zero, providing a robust test of the sorting and interleaving mechanism.