Problem 2145: Count the Hidden Sequences

Problem Information

Difficulty: Medium
Acceptance Rate: 56.78%
Paid Only: No
Tags: Array, Prefix Sum

Problem Description

You are given a **0-indexed** array of `n` integers `differences`, which describes the **differences** between each pair of **consecutive** integers of a **hidden** sequence of length `(n + 1)`. More formally, call the hidden sequence `hidden`, then we have that `differences[i] = hidden[i + 1] - hidden[i]`.

You are further given two integers `lower` and `upper` that describe the **inclusive** range of values `[lower, upper]` that the hidden sequence can contain.

* For example, given `differences = [1, -3, 4]`, `lower = 1`, `upper = 6`, the hidden sequence is a sequence of length `4` whose elements are in between `1` and `6` (**inclusive**). * `[3, 4, 1, 5]` and `[4, 5, 2, 6]` are possible hidden sequences. * `[5, 6, 3, 7]` is not possible since it contains an element greater than `6`. * `[1, 2, 3, 4]` is not possible since the differences are not correct.

Return _the number of**possible** hidden sequences there are._ If there are no possible sequences, return `0`.

Example 1:

Input: differences = [1,-3,4], lower = 1, upper = 6 **Output:** 2 **Explanation:** The possible hidden sequences are: - [3, 4, 1, 5] - [4, 5, 2, 6] Thus, we return 2.

Example 2:

Input: differences = [3,-4,5,1,-2], lower = -4, upper = 5 **Output:** 4 **Explanation:** The possible hidden sequences are: - [-3, 0, -4, 1, 2, 0] - [-2, 1, -3, 2, 3, 1] - [-1, 2, -2, 3, 4, 2] - [0,

3, -1, 4, 5, 3] Thus, we return 4.

Example 3:

Input: differences = [4,-7,2], lower = 3, upper = 6 **Output:** 0 **Explanation:** There are no possible hidden sequences. Thus, we return 0.

Constraints:

* `n == differences.length` * `1 <= n <= 105` * `-105 <= differences[i] <= 105` * `-105 <= lower <= upper <= 105`

Code Snippets

C++:

```
class Solution {
public:
int numberOfArrays(vector<int>& differences, int lower, int upper) {

}
};
```

Java:

```
class Solution {
public int numberOfArrays(int[] differences, int lower, int upper) {

}
}
```

Python3:

```
class Solution:
def numberOfArrays(self, differences: List[int], lower: int, upper: int) ->
int:
```