COUNT NEGATIVES IN SORTED MATRIX

Monday, December 29, 2025 1:39 AM

1. The Core Concept

The problem gives us rows sorted in Descending Order (Positive → Negative)

- Example Row: [4, 3, 2, -1, -2, -3]
- The Rule: Once the number turn negative, they stay negative until the end of the row.

Key Insight: We don't need to count every negative number individually. We only need to find the index where the first negative number appears.

- If the first negative is at index 3, then indices 3, 4, 5... end are all negative.
- We can use math to count them instantly.

2. The Logic

We use Binary Search to find that specific "transition point" (Positive → Negative).

The Two Rules of Movement:

1. If grid[mid] is POSITIVE (>=0):
   - we are currently in the safe zone. The negative numbers must be further down the line.
   - Action: Move right (start = mid+1)
2. If grid[mid] is NEGATIVE (<0):
   - we hit a negative! BUT, we don't know if it's the first one. There might be another negative number to its left.
   - Action: Record this index, then move left to check for earlier ones (end = mid-1)

3. The Math Formula

Once we find the first_neg_index, we calculate the count using Subtraction.

Count = Total length − First Neg Index