Count Distinct Elements

Function: int countDistinct(vector& nums);
Description: Return the number of unique elements.
Examples:

nums=[1,2,2,3] → 3
nums=[5,5,5] → 1
nums=[10,20,30] → 3

Count K-Difference Pairs

Function: int countKDiffPairs(vector& nums, int k);
Description: Count pairs where |a-b| = k.
Examples:

[1,3,5,7], k=2 → 3
[4,4,4], k=0 → 1
[1,5,9], k=4 → 2

Majority Element > n/3

Function: vector majorityElementNby3(vector& nums);
Description: Return elements appearing more than n/3 times.
Examples:
[3,2,3] → [3]
[1,1,1,2,2] → [1]
[2,2,9,9,9,2] → [2,9]

Longest Consecutive Sequence

Function: int longestConsecutive(vector& nums);
Description: Find longest consecutive integer chain.
Examples:
[100,4,200,1,3,2] → 4
[] → 0
[1,2,0,1] → 3

Subarrays With Sum = K

Function: int subarraySumEqualsK(vector& nums, int k);
Description: Count subarrays that sum to k.
Examples:

[1,1,1], k=2 → 2
[1,2,3], k=3 → 2
[3,4,7,2,-3], k=7 → 3

Longest Subarray Sum ≤ K

Function: int longestSubarrayLessEqualK(vector& nums, int k);
Description: Max length of subarray with sum <= K.
Examples:

[2,3,-1,4], K=5 → 3
[1,2,3], K=3 → 2
[-1,-1,-1], K=-1 → 1

Maximum Width Ramp

Function: int maxWidthRamp(vector& nums);
Description: Find max j-i such that nums[j] ≥ nums[i].
Examples:
[6,0,8,2,1,5] → 4
[9,8,1,0,1,9] → 5
[1,2,3] → 2

Count Subarrays With All Elements ≤ K

Function: long long countSubarraysAllLessEqualK(vector& nums, int k);
Description: Subarrays where every element ≤ K.
Examples:
[1,2,3], K=3 → 6
[2,5,4], K=3 → 1
[3,3,3], K=3 → 6

Maximum Product Subarray

Function: int maxProduct(vector& nums);
Description: Return maximum possible product.
Examples:
[2,3,-2,4] → 6
[-2,0,-1] → 0
[-2,3,-4] → 24

Split Array Equal Sum (Prefix)

Function: bool canPartitionPrefix(vector& nums);
Description: Check if array can be split into 2 equal-sum continuous parts.
Examples:
[1,2,1,2] → true
[3,3] → true
[1,2,3,3] → false
