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Coding Practice Problems

These are original, high-yield problems selected to cover commonly reported CoCubes-style skills. Time yourself.

Problem 1 — Unit digit of a power

Given non-negative integers x and y , print the unit digit of x raised to y . Do not compute the full power when y is large.

Target: $O(1)$ or $O(\log y)$, depending on method.

Problem 2 — Card total

Given n integer card values, print their total and the count of positive cards.

Target: $O(n)$, $O(1)$ extra space.

Problem 3 — First unique character

Given a lowercase string, print the first character that occurs exactly once. Print -1 if none exists.

Target: $O(n)$, frequency map.

Problem 4 — Pair with target sum

Given an array and target T , determine whether two distinct positions have values that sum to T .

Target: $O(n)$ average with hash set/map.

Problem 5 — Valid palindrome

Given a string containing letters and digits, ignore case and non-alphanumeric characters. Determine whether it is a palindrome.

Target: $O(n)$, two pointers.

Problem 6 — Balanced brackets

Given a string of parentheses, square brackets and braces, determine whether it is balanced.

Target: $O(n)$, stack.

Problem 7 — Second largest distinct value

Given n integers, print the second largest distinct value, or -1 if it does not exist.

Target: $O(n)$, $O(1)$ extra space.

Problem 8 — Longest equal-half digit substring

Given a digit string, find the maximum even length such that the sum of the first half equals the sum of the second half.

Target: try $O(n^2)$ after understanding constraints; prefix sums can improve sum checks.

Problem 9 — Count subarrays with sum K

Given integer array and K , count contiguous subarrays with sum K .

Target: $O(n)$ average with prefix-sum frequency map.

Problem 10 — Grid shortest path

Given a grid with open cells and blocked cells, find shortest four-direction path length from start to target, or -1.

Target: $O(\text{rows} \times \text{columns})$, BFS.

Solutions and methods: [\[\[05_Coding/Coding_Solutions|Coding solutions\]\]](#).