Python Problem Statements

1. Problem – Anagram Groups

Problem Statement:

Given a list of words, group the words that are anagrams of each other.
Two words are anagrams if they contain the same letters in any order.
The output should be a list of groups, where each group contains words that are anagrams.

Example:

Input: ["eat", "tea", "tan", "ate", "nat", "bat"]
Output: [["eat", "tea", "ate"], ["tan", "nat"], ["bat"]]

2. Problem – Longest Consecutive Sequence

Problem Statement:

Given an unsorted list of integers, find the length of the longest consecutive sequence.
Consecutive sequence means numbers that appear in a row without gaps.
The sequence does not need to be in sorted order in the input.

Example:

Input: [100, 4, 200, 1, 3, 2]
Output: 4
Explanation: The longest consecutive sequence is [1, 2, 3, 4]

3. Problem – Unique Character Substring

Problem Statement:

Given a string, find the length of the longest substring without repeating characters.
The substring must be contiguous (characters next to each other).

Example:

Input: "abcabcbb"
Output: 3
Explanation: The longest substring without repeating characters is "abc"

4. Problem – Spiral Matrix

Problem Statement:

Given a 2D matrix of size m x n, return all elements of the matrix in spiral order.
You need to start from the top-left corner and move right, then down, then left,
and then up, and so on.

Example:

Input:
[
 [1, 2, 3],
 [4, 5, 6],
 [7, 8, 9]
]
Output: [1, 2, 3, 6, 9, 8, 7, 4, 5]

5. Problem – Stock Buy and Sell

Problem Statement:

You are given a list where each element represents the stock price on a given day.
You need to find the maximum profit you can make by buying on one day and
selling on another day in the future.
If no profit is possible, return 0.

Example:

Input: [7, 1, 5, 3, 6, 4]
Output: 5
Explanation: Buy at price 1, sell at price 6