Python Coding Questions

1.Check if a string is a subsequence of another string

2.Write a function that takes two strings and returns True if the first string is a subsequence of the second (i.e., its characters appear in the same order, but not necessarily consecutively).

Example: "abc" is a subsequence of "axbyc" (True), but not of "bca" (False).

Constraint: Do not use additional data structures beyond a few variables.

Find the maximum product of two numbers in a list

3.Write a function to find the maximum product of any two numbers in a list of integers, handling both positive and negative numbers.

Example: For [2, -3, 5, -1, 4], the maximum product is 20 (5 * 4).

Constraint: Do not sort the list.

4.Rotate a matrix 90 degrees clockwise without extra space

5.Write a function to rotate an NxN matrix 90 degrees clockwise in-place (without using additional space proportional to the matrix size).

Example: [[1,2],[3,4]] → [[3,1],[4,2]].

Constraint: Modify the input matrix directly.

6.Find the longest palindromic substring

7.Write a function to find the longest substring in a given string that is a palindrome.

Example: For "babad", return "bab" or "aba".

Constraint: Avoid using extra space beyond O(1) for variables (e.g., no dynamic programming table).

Implement a function to detect a cycle in a linked list

8.Generate Pascal’s triangle up to n rows

9.Write a function to generate the first n rows of Pascal’s triangle as a list of lists.

Example: For n=4, output [[1], [1,1], [1,2,1], [1,3,3,1]].

Constraint: Use iteration, not recursion.

10.Print a spiral star pattern

Write a function that takes an integer n and prints a spiral star pattern of size n x n, where stars form a clockwise spiral starting from the top-left.

Example: For n=3,