Question 1: Calculate Euclidean distance

Write a Python program to calculate Euclidean Distance.

Example 1:

Input:

Given First point values P(x1, y1) : 6 , 7

Given second point values Q(x2, y2) : 5, 4

Output:

The Euclidean Distance between the above given two points 'PQ' = 3.1622776601683795

Question 2: Reverse User Input for Data Processing

Imagine you are developing a secure system for user input validation, and part of the system involves reversing strings (such as passwords or IDs) for a unique encryption method.

Write a Python program that accepts a string from the user and returns it in reverse order. This could simulate part of a process where data is transformed before being stored or transmitted securely.

Example 1:

Input:

1234abcd

Output:

dcba4321

Explanation:

Reverse of 1234abcd is dcba4321

Example 2:

Input:

Python@123

Output:

321@nohtyP

Explanation:

Reverse of Python@123 is 321@nohtyP

Question 3: Finding indices of Closest Temperatures

Imagine you work for a weather station, and you have a list of temperatures recorded throughout the day. Your job is to find which two temperatures in the list are the most similar (closest in value). Once you find the two closest temperatures, you need to tell their positions (indices) in the list.

Note: **"Closest"**, we mean finding two numbers that have the smallest difference between them.

Example 1:

Input:

[1, 7, 9, 2, 10]

Output:

[0, 3]

Explanation:

The output [0, 3] represents the indices of the closest pair of numbers in the list [1, 7, 9, 2, 10]. The numbers at indices 0 and 3 are 1 and 2, which have the smallest difference (1).

Example 2:

Input:

[5, 8, 12, 15, 7]

Output:

[4, 1]

Explanation:

The output [4, 1] represents the indices of the closest pair of numbers in the list [5,8,12,15,7]. The numbers at indices 4 and 1 are 7 and 8 which have the smallest difference (1).
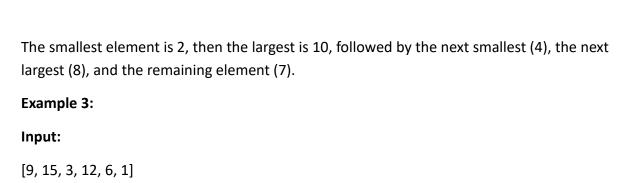
Example 3:

Input:

[100, 101, 99, 103, 105]

Output:

[0, 1]

Explanation:

The output [0, 1] represents the indices of the closest pair of numbers in the list [100, 101, 99, 103, 105]. The numbers at indices 0 and 1 are 100 and 101, which have the smallest difference (1).

Question 4: Strange Sort: Alternating Smallest and Largest

In an amusement park ticket queue, visitors are sorted in a strange manner. The smallest number (representing the youngest visitor) stands first, followed by the oldest visitor. The next youngest visitor stands next, followed by the next oldest visitor, and so on. Write a Python program to sort a list of numbers in such a "strange sort," where the first element is the smallest, the second is the largest, the third is the next smallest, and so on.

Example 1:

Input:

[1, 3, 4, 5, 11]

Output:

[1, 11, 3, 5, 4]

Explanation:

The smallest element is 1, then the largest is 11, followed by the next smallest (3), the next largest (5), and the remaining element (4).

Example 2:

Input:

[7, 2, 10, 4, 8]

Output:

[2, 10, 4, 8, 7]

Explanation:

The smallest element is 2, then the largest is 10, followed by the next smallest (4), the next largest (8), and the remaining element (7).

Example 3:

Input:

[9, 15, 3, 12, 6, 1]

Output:

[1, 15, 3, 12, 6, 9]

Explanation:

The smallest element is 1, then the largest is 15, followed by the next smallest (3), the next largest (12), and so on.

Question 5: Check if a String is Pangram

You are designing a chatbot for an e-commerce platform. The chatbot is expected to understand and respond to user queries efficiently. To ensure that it can handle diverse inputs, you need to verify that its internal processing covers all possible alphabetical characters. A pangram is a sentence that contains every letter of the English alphabet at least once.

Write a Python function that takes a string as input and checks whether the string is a pangram (contains every letter of the alphabet at least once).

Example 1:

Input:

The quick brown fox jumps over the lazy dog

Output:

True

Explanation:

This is a famous pangram that contains all the letters of the alphabet.

Example 2:

Input:

Pack my box with five dozen liquor jugs.

Output:

True

Explanation:

This is a famous pangram that contains all the letters of the alphabet.

Example 3:

Input:

I love programming in Python

Output:

False

Explanation:

This string is missing several letters, such as 'z', 'j', and 'k', so it is not a pangram.