

1 Office Files Verification (Sorted Check)

Problem (Real-life):

An HR system stores employee IDs in an array. The HR manager wants to verify whether the IDs are arranged in increasing order before uploading them to the central server. Due to security rules, the system can only check one adjacent pair at a time and then pass the remaining work to the same process.

Task:

Using recursion, check whether the employee ID list is sorted or not.

(Hint: Compare the current ID with the next, then recursively check the remaining list.)

2 Lost Document Search in Records Room (Linear Search)

Problem:

A records room contains thousands of files arranged in a line. A clerk is asked to find the **first occurrence** of a document with a specific reference number. He checks one file at a time and if it doesn't match, asks the same process to continue from the next file.

Task:

Write a recursive function to find the **first index** of the given document number.

3 CCTV Review – Last Seen Moment (Last Index)

Problem:

A security team reviews CCTV footage stored frame-by-frame in an array. A suspicious person appears multiple times in the footage. The team needs to find the **last frame** where the person appeared.

Condition:

The footage can be reviewed only sequentially, but the final answer must be the **latest appearance**.

Task:

Use recursion to find the **last index** of the target frame.

4 Warehouse Rearrangement (Reverse Array)

Problem:

A warehouse stores packages in a straight line. Due to a conveyor belt issue, the order of packages must be completely reversed using an automated robot.

The robot swaps the first and last package, then calls itself to rearrange the remaining middle section.

Task:

Use recursion to reverse the array of package IDs.

5 Spam Filter in Email System (Remove Character)

Problem:

An email filter removes all special symbols (like #) from incoming messages before delivery.

The system reads one character, decides whether to keep it or discard it, and then applies the same rule to the rest of the message.

Task:

Using recursion, remove a given character from the string.

6 Voice Assistant – Vowel Counter (Count Vowels)

Problem:

A voice assistant analyzes spoken text and needs to count how many vowels are present in a sentence to calculate pronunciation accuracy.

It checks one character at a time and delegates the remaining analysis to itself.

Task:

Count the number of vowels in a string using recursion.

7 Bank Security Check (Palindrome Validation)

Problem:

A bank generates security codes that must read the same forward and backward.

The system compares the first and last characters, then recursively checks the inner part of the code.

Task: Using recursion, determine whether the given security code is a palindrome.