

Technical Assignment

Instructions:

- Thank you very much for your interest in joining Fcode Labs.
- This assignment is mandatory for shortlisting to interview rounds.
- Answer in a separate document indicating the question number and convert the answer sheet to PDF and upload to the relevant link with your contact details. Rename the file with your name. Do not Zip.
- The deadline is mentioned in the email. However, the interviews will be scheduled first come first serve basis.
- If you have any further questions, please feel free to email: careers@fodelabs.com

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Question 1:

Write a pseudo-code or code in any programming language for the following scenario.

Given an array of pairs of integers, find all symmetric pairs, i.e., pairs that mirror each other. For instance, pairs (x, y) and (y, x) are mirrors of each other.

For example,

Input: {3,4},{1,2},{5,2},{7,10},{4,3},{2,5}

Output: {3,4}|{4,3},{2,5}|{5,2}

Question 2:

Write a pseudo-code or code in any programming language for the following scenario.

Find duplicates within a range `k` in an array

Given an array and a positive number k, check whether the array contains any duplicate elements within the range k. If k is more than the array's size, the solution should check for duplicates in the complete array. For example,

Input: nums[] = { 5, 6, 8, 2, 4, 6, 9 } k = 4

Output: Duplicates found

(Reason: element 6 repeats at distance 4 which is $\leq k$)

Input: nums[] = { 5, 6, 8, 2, 4, 6, 9 } k = 2

Output: No duplicates were found

(Reason: element 6 repeats at distance 4 which is $> k$)

Input: nums[] = { 1, 2, 3, 2, 1 } k = 7

Output: Duplicates found

(Reason: element 1 and 2 repeats at distance 4 and 2, respectively which are both $\leq k$)

Question 3:

Briefly explain a way to find the largest number of an array without using any sorting algorithm. You may use a pseudo-code or any programming language.

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Question 4:

Briefly explain how you would apply OOP concepts to a real-world scenario of your choice if you were to write a program. Please keep in mind that explaining OOP concepts is **not necessary**, simply how to use them.

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