



COMSATS University Islamabad, Lahore Campus

Assignment #4 – SPRING 2023

Course Title:	Design and Analysis of Algorithms				Course Code:	CSC301	Credit Hours:	3
Course Instructor:	Dr. Hasan Jamal				Programme Name:	BCS		
Semester:	5 th	Batch:	SP17	Section:	A & B	Date:	10/05/2023	
Deadline:	14/05/2023				Maximum Marks:		20	

Important Instructions / Guidelines:

- Handwritten strictly.
- Maximum three persons per group are allowed for submission.
- No late submission allowed

Question: <Applying>

[Marks: 10]

Devise an algorithm for the below program using proper notations:

Jhon declared an array of size 10 and stored employee's id temporarily without any backup. A thread in a process has deleted or override data at a specific index. Retrieval of information is required but invalid state has been occurred. Only one cell is lost.

Note: Don't suggest any backup array for this problem due to less storage of jhons' system.

Solution:

Pseudo Code:

- 1) Take XOR of all the array elements are stored in a variable named 'key'.
- 2) After information loss, take XOR of all the array elements with key except that one which contains invalid data and store the result at that index where invalid data is present.

Validation:

2	3	5	7
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Key = 2 XOR 3 XOR 5 XOR 7 = $2 \wedge 3 \wedge 5 \wedge 7 = 3$

Let say Array [2] has lost data:

2	3	0	7
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Temp = 2 XOR 3 XOR **key** XOR 7 = $2 \wedge 3 \wedge 3 \wedge 7 = 5$

Store Temp at Array [2]

2	3	5	7
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This problem is applicable if only one block of data is lost.

