# UVCE Campus 2024 - Question Paper

Candidates need to solve the below questions and submit their response. Here are the rules for sharing the response

- Name files appropriately like `Question1.java`, `Question2.java` & `Question3.SQL`
- Mention time and time complexity of your solution where ever applicable
- Use comments where ever applicable
- Create a bitbucket/git public repository
- Push the answers to the git repository
- Share the repository details for evaluation

## Question 1

You are given an integer *m* ($1 \leq m \geq 1\ 000\ 000$) and two non-empty, zero-indexed arrays ***A*** and ***B*** of n integers, a0, a1, ... , $a_{n-1}$ and b0, b1, ... , $b_{n-1}$ respectively ($0 \leq ai, bi \leq m$).

The goal is to check whether there is a swap operation which can be performed on these arrays in such a way that the sum of elements in array ***A*** equals the sum of elements in array ***B*** after the swap. By swap operation we mean picking one element from array ***A*** and one element from array ***B*** and exchanging them.

**Expectations**

1. Solution to the problem
2. Complexity of the algorithm both time and space

Chose any language of choice.

```
solution(int[] A, int[] B, m){
  //
  ....
  //
}
```

## Question 2

Assume a singly linked list with **no access to head** node or pointer.

**Expectations**

1. Design an algorithm to delete a node from the list where the node to be deleted is passed as an argument to the method
2. Write the code to implement the method `deleteNode(Node n);`
3. List down any corner cases
4. Complexity of the algorithm

Chose any language of choice.

**Example:**

a → b → c → d → e

```
deleteNode(Node n){
  //
  //
}
```

```
deleteNode(c);
```

a → b → d → e

## Question 3

You have the following tables

**Table name**: DEPARTMENT

| ID | Name | Location |
|---|---|---|
| 1 | Engineering | Bangalore |
| 2 | Sales | Delhi |
| 3 | Operations | Delhi |
| 4 | Product | Bangalore |
| 5 | Production | Hyderabad |

**Table name**: EMPLOYEE

| ID | Name | Department | Manager | Salary |
|---|---|---|---|---|
| 1 | Ram | 1 | NULL | 2,00,000 |
| 2 | Vimal | 1 | 1 | 1,50,000 |
| 3 | Albert | 1 | 1 | 1,00,000 |
| 4 | John | 2 | NULL | 2,00,000 |
| 5 | Taj | 2 | 4 | 1,00,000 |
| 6 | Deepak | 2 | 4 | 75,000 |
| 7 | Raju | 3 | NULL | 1,00,000 |
| 8 | Ramesh | 3 | 7 | 50,000 |
| 9 | Jyoti | 4 | NULL | 2,00,000 |
| 10 | Prince | 5 | NULL | 2,00,000 |

**Expectations**

1. Write SQL query to create the above tables
2. Add the keys and indexes for the above table
3. Write SQL query to insert the data given
4. Write SQL query to list department wise employee count at each location
5. Write SQL query to calculate and list the average salary of employees under each manager