Question 4.

SELECT e.employee\_id, e.first\_name, e.last\_name, d.department\_name

FROM employees e

LEFT JOIN departments d ON e.department\_id = d.department\_id

WHERE e.hire\_date > '2020-01-01'

ORDER BY e.last\_name;

**Issues**

This query will return all records from the employee table on top of those that match the e.hire\_date > '2020-01-01' criteria.

This leads to an unnecessary large amount of data from the employee table.

**Optimization**

**Using INNER JOIN**

Consider using INNER JOIN to retrieve only matched records

SELECT e.employee\_id, e.first\_name, e.last\_name, d.department\_name from employee e INNER JOIN

department d on e.department\_id = d.department\_id WHERE e.hire\_date > '2020-01-01' ORDER BY e.last\_name

With this query, only records that employees that match the department\_id would be retrieved.

***Creating Non-clustered index***

Index can potentially improve performance of a query. So we are creating a non-clustered index based on Employee\_Id, department\_id and hire\_date.

*CREATE NONCLUSTERED INDEX Idx\_Employee\_EmployeeDeptHireDate on Employee (Employee\_Id, department\_id, hire\_date)*

This index is optimised for the query above and hence should be faster with the cost of *additional storage*.

*Note: Always review SQL execution plan to see the results of performance optimization.*