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Topic – SQL Assignment : 05

Batch - DATACOM+5G Dev

Batch Id - 25SUB4505

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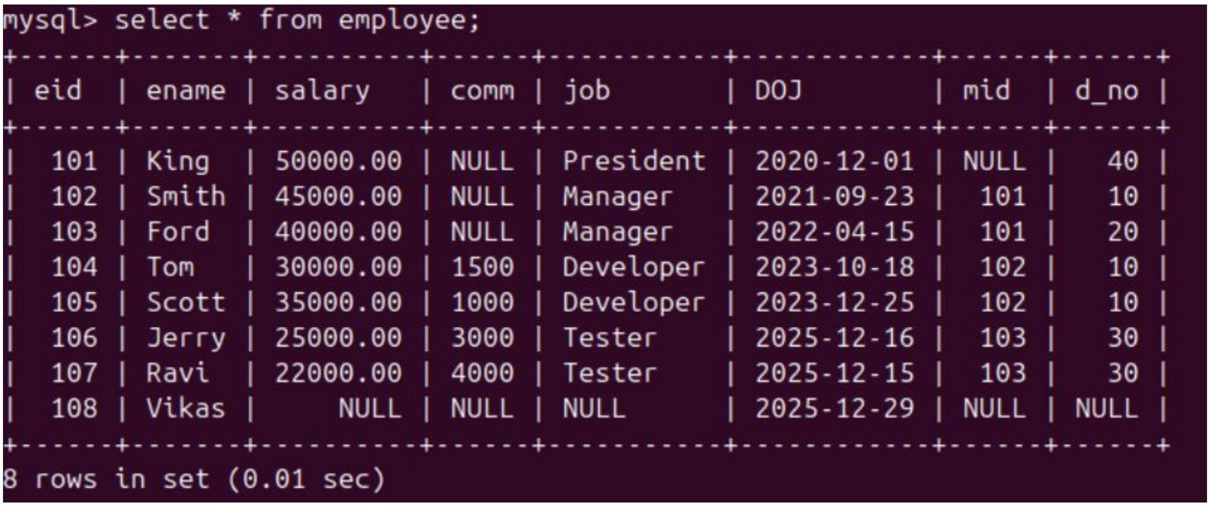
Assigment 5 : Demonstrate the creation of an index on a table and discuss how it improves query performance. Use a DROP INDEX statement to remove the index and analyze the impact on query execution.

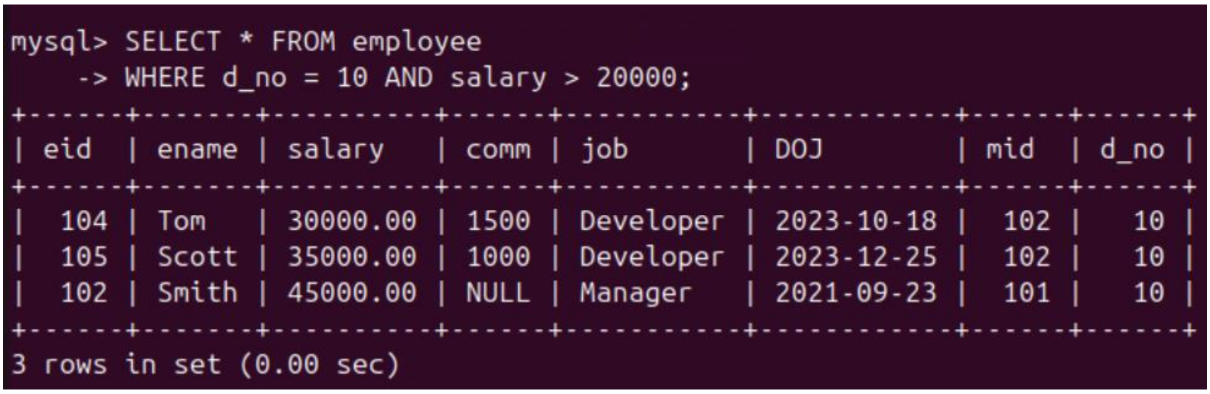
Solution : Using the Employee data lets analyze;



```
mysql> select * from employee;
+------+-------+----------+------+-----------+------------+------+------+
| eid  | ename | salary   | comm | job       | DOJ        | mid  | d_no |
+------+-------+----------+------+-----------+------------+------+------+
|  101 | King  | 50000.00 | NULL | President | 2020-12-01 | NULL |   40 |
|  102 | Smith | 45000.00 | NULL | Manager   | 2021-09-23 |  101 |   10 |
|  103 | Ford  | 40000.00 | NULL | Manager   | 2022-04-15 |  101 |   20 |
|  104 | Tom   | 30000.00 | 1500 | Developer | 2023-10-18 |  102 |   10 |
|  105 | Scott | 35000.00 | 1000 | Developer | 2023-12-25 |  102 |   10 |
|  106 | Jerry | 25000.00 | 3000 | Tester    | 2025-12-16 |  103 |   30 |
|  107 | Ravi  | 22000.00 | 4000 | Tester    | 2025-12-15 |  103 |   30 |
|  108 | Vikas |     NULL | NULL | NULL      | 2025-12-29 | NULL | NULL |
+------+-------+----------+------+-----------+------------+------+------+
8 rows in set (0.01 sec)
```

1.

- After creating the index on d_no and salary, running the same query will be much faster:



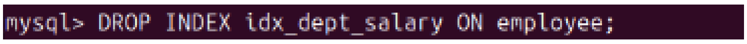
```
mysql> SELECT * FROM employee
    -> WHERE d_no = 10 AND salary > 20000;
+------+-------+----------+------+-----------+------------+------+------+
| eid  | ename | salary   | comm | job       | DOJ        | mid  | d_no |
+------+-------+----------+------+-----------+------------+------+------+
|  104 | Tom   | 30000.00 | 1500 | Developer | 2023-10-18 |  102 |   10 |
|  105 | Scott | 35000.00 | 1000 | Developer | 2023-12-25 |  102 |   10 |
|  102 | Smith | 45000.00 | NULL | Manager   | 2021-09-23 |  101 |   10 |
+------+-------+----------+------+-----------+------------+------+------+
3 rows in set (0.00 sec)
```

2.

- Without the index, the database will likely use a **full table scan**, which is much slower when you have a large number of rows.
- Without the Index: After dropping the index, queries will again require a full table scan, leading to **slower query performance**, especially for large datasets.
- **Performance Analysis**:

  i. **Before Index**: The query is slower because of the full scan.
  ii. **After Index**: The query is faster due to the index seek.

iii. **After Dropping Index**: The query slows down again because the database has to scan all the rows.



```
mysql> DROP INDEX idx_dept_salary ON employee;
```

3.