MySQL Workshop Materials for LINUX Users

Disclaimer:- *This materials designed for educational purposes only,Ideas,contents are my own not to ORACLE Corp*.

SQL Query Tuning - MySQL Performance

Understanding the Query Execution Plan with the `EXPLAIN` Statement

1.Execute Below SQL statement in MySQL Prompt

EXPLAIN SELECT Name FROM city WHERE District = 'Zhejiang' ORDER BY Population DESC\G ;

What is the access method for this query?

- Which indexes can the optimizer use for this query?

- What information does the `Extra` column contain?

- Does this query perform well? Why?

- What change must you make to the table to prevent the query from performing a full table scan?

1. **Improve the performance of the query by making the change identified in the previous step. And Re-Run EXPLAIN**

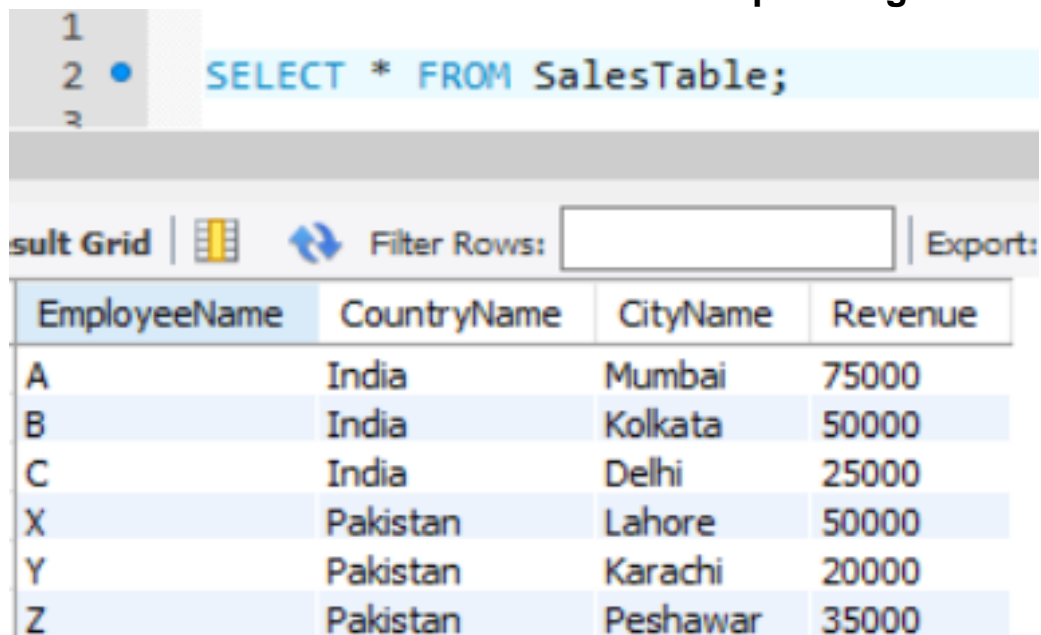mysql> **ALTER TABLE city ADD INDEX (District);**

What is the access method for this query?

- What key does the optimizer use?

- What information does the `Extra` column contain?

- Does the change you implemented in the preceding step improve the performance of the query? Why?

5. Re-issue the `EXPLAIN` statement from step 1.
- What key does the optimizer use?

- What information does the `Extra` column contain?

- Does this change improve the performance of the query? Why?

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1. **Create Sales Table and Insert Records as per Image below ?**

```
1
2 ●    SELECT * FROM SalesTable;
3
```

sult Grid | | | | Filter Rows: | | | Export:

EmployeeName	CountryName	CityName	Revenue
A	India	Mumbai	75000
B	India	Kolkata	50000
C	India	Delhi	25000
X	Pakistan	Lahore	50000
Y	Pakistan	Karachi	20000
Z	Pakistan	Peshawar	35000

2. **Find the maximum Revenue by Country ?**
3. **Find the 1st Top SalesPerson for each country ?**
4. **Find the 2nd Top SalesPerson for each country ?**
5. **Find the 3rd Top SalesPerson for each country ?**
6. **Query Optimization**

How to Re-Write Query without Sub-Query and Temporary Table ? -

2.**Find the maximum Revenue by Country ?**

Answer:-

```
 1
 2 ●   SELECT EmployeeName, CountryName, CityName, Revenue FROM SalesTable
 3        WHERE (CountryName,Revenue) IN (
 4                                         SELECT CountryName , MAX(Revenue)Revenue
 5                                           FROM SalesTable GROUP BY CountryName
 6                                       );
```

sult Grid | Filter Rows: [   ] Export: | Wrap Cell Content: A

EmployeeName	CountryName	CityName	Revenue
A	India	Mumbai	75000
X	Pakistan	Lahore	50000

What is the Problem with above Query?

Run Explain and try to improve the Query?

Optimize Query:-

```
 2 ●   SELECT EmployeeName, CountryName, CityName, Revenue FROM
 3     (
 4 ⊠      SELECT *, DENSE_RANK() OVER (PARTITION BY CountryName ORDER BY Revenue DESC) AS Ranks
 5        FROM SalesTable
 6     )A WHERE  Ranks=1;
```

ult Grid | Filter Rows: [   ] Export: | Wrap Cell Content: A

EmployeeName	CountryName	CityName	Revenue
A	India	Mumbai	75000
X	Pakistan	Lahore	50000

3.Find the 2nd Top SalesPerson for each country ?

```
 2 ●   SELECT EmployeeName, CountryName, CityName, Revenue FROM SalesTable
 3        WHERE (CountryName,Revenue)
 4            IN (
 5                   SELECT CountryName,MAX(Revenue)Revenue   FROM SalesTable
 6
 7                   WHERE (CountryName,Revenue) NOT IN
 8                                     (
 9                                       SELECT CountryName , MAX(Revenue)Revenue
10                                         FROM SalesTable GROUP BY CountryName
11                                     )
12                   GROUP BY CountryName
13            );
```

esult Grid | Filter Rows: [   ] Export: | Wrap Cell Content: A

EmployeeName	CountryName	CityName	Revenue
B	India	Kolkata	50000
Z	Pakistan	Peshawar	35000

Optimize Query:-

```
2 ●     SELECT EmployeeName, CountryName, CityName, Revenue FROM
3   ⊟ (
4 ❌         SELECT *, DENSE_RANK() OVER (PARTITION BY CountryName ORDER BY Revenue DESC) AS Ranks
5   └       FROM SalesTable
6       )A WHERE  Ranks=2 ;
```

esult Grid | ▦ | ↻ Filter Rows: [   ] | Export: ▦ | Wrap Cell Content: 🅰

EmployeeName	CountryName	CityName	Revenue
B	India	Kolkata	50000
Z	Pakistan	Peshawar	35000

Home Work
What is CTE & Windows Functions , How it Works ?
https://dev.mysql.com/doc/refman/8.0/en/with.html

Understanding Performance [support.oracle.com→knowledge]→search

- Master Note for Query Rewriting (Doc ID 2051817.1)
- How to Get Started on Query Tuning (Doc ID 1581857.1)
- Recommended Settings for MySQL 5.6, 5.7 Server for Online Transaction Processing (OLTP) and Benchmarking (Doc ID 1531329.1)

- MySQL Performance Tuning Best Practices (Doc ID 1678101.1)