

## 122022010 Shrayank Mistry

**Description:** Comparing query evaluation performance before and after applying query optimization techniques.

**Tools:** MySQL Server (Oracle), SQL (Structured Query Language)

### Query (1)

1). Get name, job title and salary of employee where salary is greater than 10000

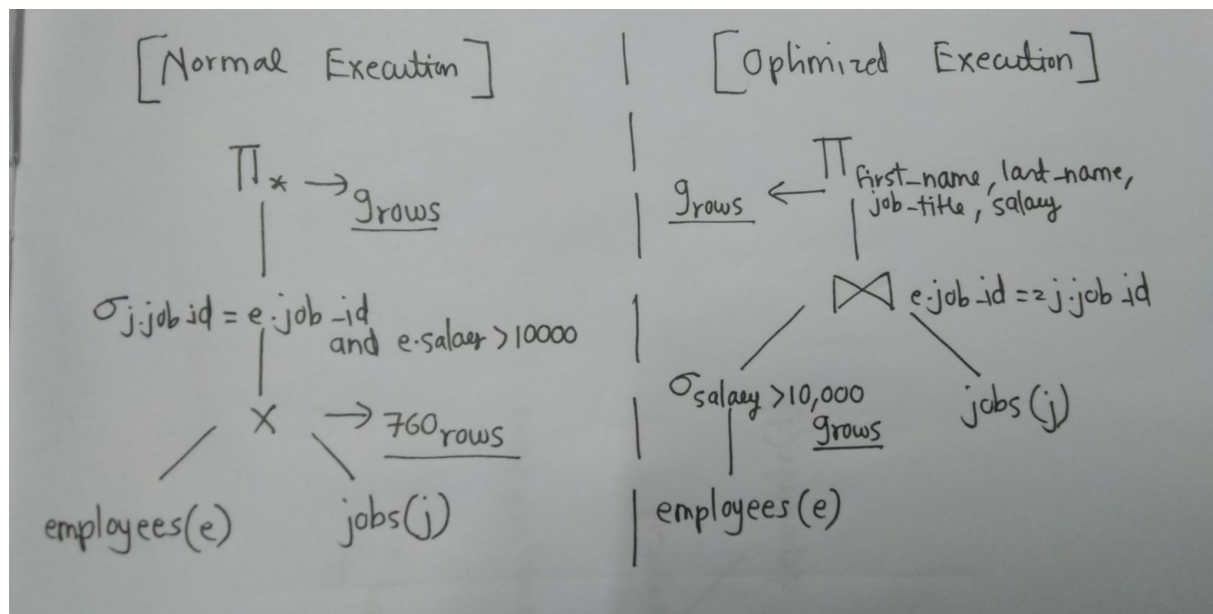
#### Normal Query

```
[SELECT * FROM employees AS e, jobs AS j WHERE j.job_id=e.job_id AND e.salary > 10000]
```

#### Optimized Query

```
[SELECT first_name,last_name,job_title,salary FROM (SELECT first_name,last_name,job_id,salary FROM employees AS e WHERE e.salary > 10000) AS et NATURAL JOIN (select job_id,job_title from jobs) as j]
```

#### Canonical Query Tree:



*First 5 timings are for Normal Query Execution and next 5 are for the Optimized Query Execution.*

Query_ID	Duration
1	0.00151600
2	0.00245325
3	0.00177275
4	0.00167975
5	0.00148500
6	0.00203600
7	0.00160875
8	0.00146375
9	0.00163900
10	0.00042925

[---- AVERAGE SPEEDUP = 1.241056188 x ----]

### Query Result:

first_name	last_name	job_title	salary
Steven	King	President	24000.00
Neena	Kochhar	Administration Vice President	17000.00
Lex	De Haan	Administration Vice President	17000.00
Nancy	Greenberg	Finance Manager	12000.00
Den	Raphaely	Purchasing Manager	11000.00
John	Russell	Sales Manager	14000.00
Karen	Partners	Sales Manager	13500.00
Michael	Hartstein	Marketing Manager	13000.00
Shelley	Higgins	Accounting Manager	12000.00

## Query (2)

1). Get name and job title of employee whose name have at least 1 occurrence of letter 't'

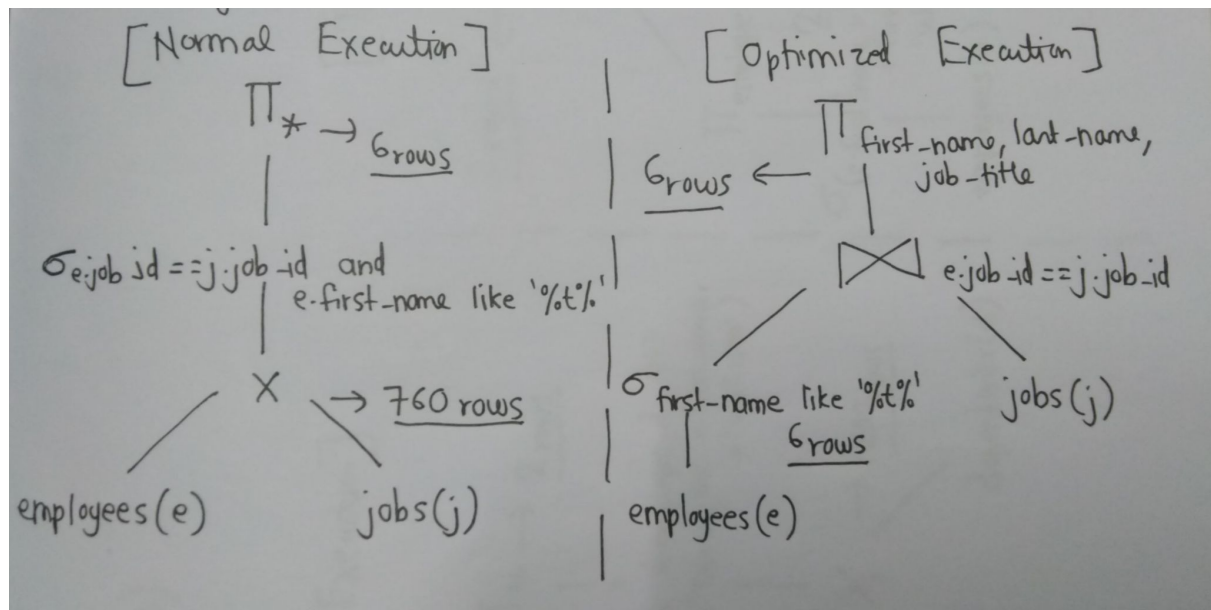
### Normal Query

```
[SELECT * FROM employees as e, jobs AS j WHERE j.job_id=e.job_id AND e.first_name LIKE '%t%']
```

### Optimized Query

```
[SELECT first_name,last_name,job_title FROM (SELECT * FROM employees AS e WHERE e.first_name LIKE '%t%') AS et NATURAL JOIN (select job_title,job_id from jobs) as j]
```

### Canonical Query Tree:



**First 5 timings are for Normal Query Execution and next 5 are for the Optimized Query Execution.**

Query_ID	Duration
1	0.00198100
2	0.00187550
3	0.00185350
4	0.00188525
5	0.00176875
6	0.00153175
7	0.00156775
8	0.00147300
9	0.00144225
10	0.00137150

[---- AVERAGE SPEEDUP = 1.267761042 x ----]

### Query Result:

first_name	last_name	job_title
Steven	King	President
Matthew	Weiss	Stock Manager
Shanta	Vollman	Stock Manager
Jonathon	Taylor	Sales Representative
Britney	Everett	Shipping Clerk
Pat	Fay	Marketing Representative

## Query (3)

1). Give me dependent names of employee Diana and John

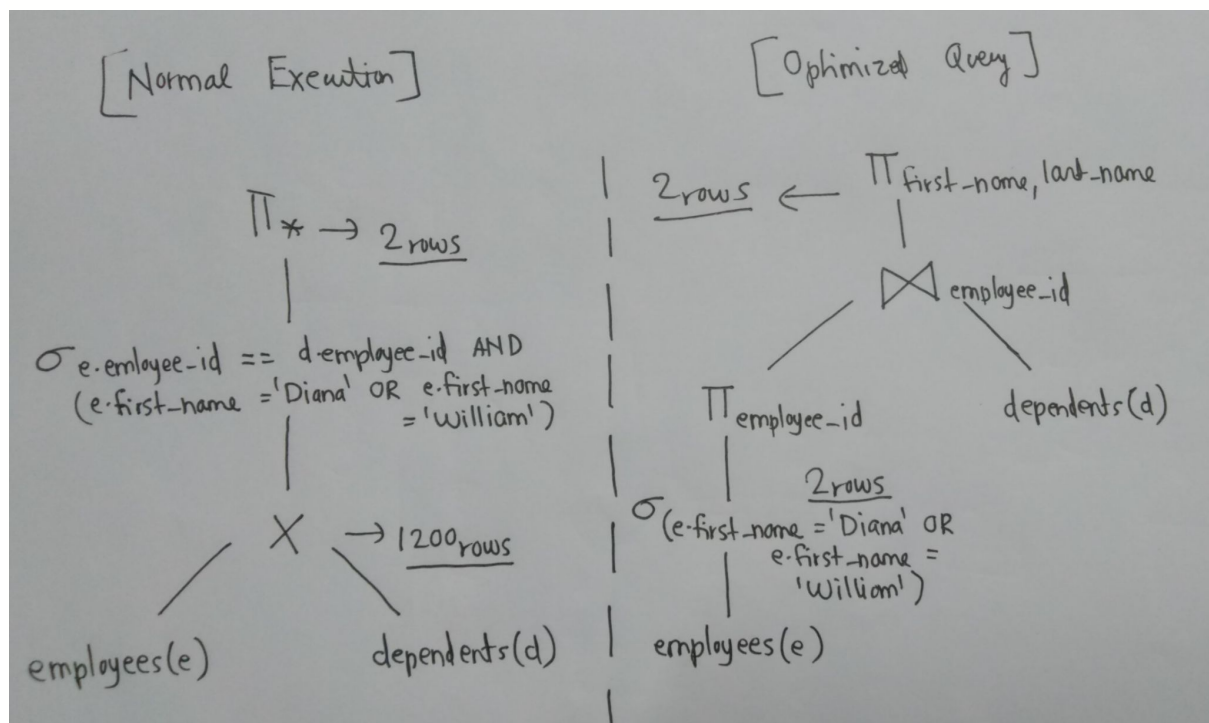
### Normal Query

```
[SELECT * FROM employees e, dependents d WHERE e.employee_id = d.employee_id AND (e.first_name = 'Diana' OR e.first_name = 'William')]
```

### Optimized Query

```
[SELECT d.first_name, d.last_name FROM (SELECT employee_id FROM employees AS e WHERE (e.first_name = 'Diana' OR e.first_name = 'William')) AS et NATURAL JOIN dependents AS d]
```

### Canonical Query Tree:



**First 5 timings are for Normal Query Execution and next 5 are for the Optimized Query Execution.**

Query_ID	Duration
1	0.00156975
2	0.00186975
3	0.00219125
4	0.00150950
5	0.00151975
6	0.00059725
7	0.00143850
8	0.00172850
9	0.00142400
10	0.00136850

[---- AVERAGE SPEEDUP = 1.320776299 x ----]

### Query Result:

first_name	last_name
Dan	Lorentz
Penelope	Gietz