

IT667 - Database Management Systems

Lab Assignment 8 - Indexing

Use the concept of indexing to create various indexes on TPC_H schemas. Use the below example to create appropriate indexes.

```
CREATE INDEX IDX_PARTSUPP_PARTKEY ON PARTSUPP (PS_PARTKEY);
```

Testing Index performance

PostgreSQL have a feature to show the analysis of the query execution based on the sorting method applied, searching method selected, filtering applied, etc. with help of the below command/query:

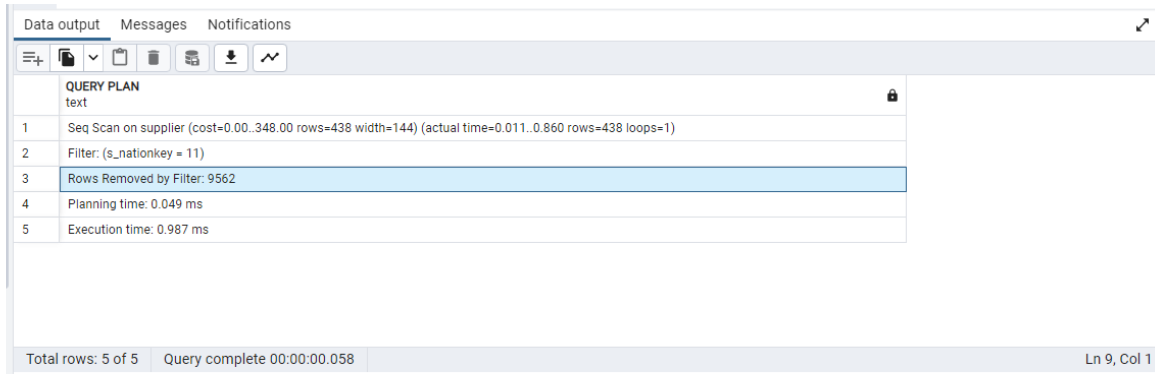
```
EXPLAIN ANALYZE query;
```

Use the above command to test the performance of the Index before and after creating the indices on the schemas.

To note the performance, you can use previously executed queries or you can build on your own (Any 5 Queries).

Two screenshots are shown below for your reference:

Before Indexing:









The screenshot displays the PostgreSQL query execution plan for a query on the 'supplier' table. The plan shows a sequential scan with a cost of 0.00..348.00, 438 rows, and a width of 144. The actual execution time was 0.011..0.860 seconds. The filter applied was '(s_nationkey = 11)', which removed 9562 rows. The planning time was 0.049 ms, and the execution time was 0.987 ms.

	QUERY PLAN
1	Seq Scan on supplier (cost=0.00..348.00 rows=438 width=144) (actual time=0.011..0.860 rows=438 loops=1)
2	Filter: (s_nationkey = 11)
3	Rows Removed by Filter: 9562
4	Planning time: 0.049 ms
5	Execution time: 0.987 ms

Total rows: 5 of 5 Query complete 00:00:00.058 Ln 9, Col 1

After Indexing:

Data output		Messages	Notifications
     			
QUERY PLAN			
text			
1	Bitmap Heap Scan on supplier (cost=11.68..241.13 rows=438 width=144) (actual time=0.086..0.246 rows=438 loops=1)		
2	Recheck Cond: (s_nationkey = 11)		
3	Heap Blocks: exact=202		
4	-> Bitmap Index Scan on idx_supplier_nation_key (cost=0.00..11.57 rows=438 width=0) (actual time=0.068..0.068 rows=438 loops=1)		
5	Index Cond: (s_nationkey = 11)		
6	Planning time: 0.061 ms		
7	Execution time: 0.268 ms		
Total rows: 7 of 7		Query complete 00:00:00.069	
		Ln 10, Col 1	

Note - It is not mandatory that every time Index helps in optimizing the performance of the query, it depends on various factors one of which is PostgreSQL's efficient query planner.