



K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)

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Experiment / assignment / tutorial No.:

7 LABWORK

Grade: AA / AB / BB / BC / CC / CD / DD

Title: Query processing and indexing

//CREATING INDEX

CREATE INDEX SSNO ON SOLDIERS(SSNO DESC);

```
392 //CREATING INDEX
393
394 CREATE INDEX SSNO ON SOLDIERS(SSNO DESC);
395
```

Data Output Explain Messages Notifications

CREATE INDEX

Query returned successfully in 450 msec.

//SEARCHING INDEX

SELECT*FROM SOLDIERS WHERE SSNO>'604';

```
396 //SEARCHING INDEX
397
398 SELECT*
399 FROM SOLDIERS WHERE SSNO>'604';
```

Data Output Explain Messages Notifications

	ssno [PK] integer	mo integer	name character varying (50)	dateofbirth date	rank character varying (25)	location character (25)	salary integer
1	605	17	VISHESH NAIK	1947-09-08	COLONEL	DELHI	120000
2	606	12	NIRMAL SINGH	1946-08-07	GENREAL MAJOR	GOA	300000
3	607	18	YOGENDRA SINGH	1949-07-06	CAPTAIN	JAMMU	80000
4	610	21	OMKAR SINGH	1947-04-03	COLONEL	DELHI	120000
5	611	22	NIRMALJIT SINGH	1948-05-04	MAJOR	GUJARAT	90000
6	612	-22	NIRMA SINGH	1945-02-02	CAPTAIN	KASHMIR	100000



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//EXPLAIN ANALYZER

EXPLAIN ANALYZE SELECT * FROM SOLDIERS WHERE NAME = 'YOGENDRA SINGH';

```
402
403 //EXPLAIN ANALYZER
404
405 EXPLAIN ANALYZE SELECT * FROM SOLDIERS WHERE NAME = 'YOGENDRA SINGH';
```

Data Output	Explain	Messages	Notifications
QUERY PLAN			
text			
1	Seq Scan on soldiers (cost=0.00..1.15 rows=1 width=306) (actual t...		
2	[...] Filter: ((name)::text = 'YOGENDRA SINGH')::text)		
3	[...] Rows Removed by Filter: 11		
4	Planning Time: 0.089 ms		
5	Execution Time: 0.023 ms		

EXPLAIN ANALYZE SELECT * FROM SOLDIERS WHERE SSNO >604 order by NAME;

```
406
407 EXPLAIN ANALYZE SELECT * FROM SOLDIERS WHERE SSNO >604 order by NAME;
408
409
```

Data Output	Explain	Messages	Notifications
QUERY PLAN			
text			
1	Sort (cost=1.19..1.20 rows=4 width=306) (actual time=0.051..0.052 rows=8 loops=1)		
2	[...] Sort Key: name		
3	[...] Sort Method: quicksort Memory: 26kB		
4	[...] -> Seq Scan on soldiers (cost=0.00..1.15 rows=4 width=306) (actual time=0.009..0.010 rows=8 loops=1)		
5	[...] Filter: (ssno > 604)		
6	[...] Rows Removed by Filter: 4		

//Select query with JOIN

EXPLAIN ANALYZE SELECT *FROM RESOURCES

RIGHT JOIN ITEMS

ON resources.rname = items.ideptname;



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```
409
410 EXPLAIN ANALYZE SELECT *FROM RESOURCES
411 RIGHT JOIN ITEMS
412 ON resources.rname = items.ideptname;
413
```

Data Output Explain Messages Notifications

QUERY PLAN	
text	
1 Hash Left Join (cost=15.85..29.02 rows=250 width=568) (actual time=9.653..9.663 rows=9 loops=1)	
2 [...] Hash Cond: (Items.ideptname = resources.rname)	
3 [...] -> Seq Scan on Items (cost=0.00..12.50 rows=250 width=288) (actual time=0.025..0.027 rows=9 loops=1)	
4 [...] -> Hash (cost=12.60..12.60 rows=260 width=280) (actual time=9.595..9.596 rows=5 loops=1)	
5 [...] Buckets: 1024 Batches: 1 Memory Usage: 9kB	
6 [...] -> Seq Scan on resources (cost=0.00..12.60 rows=260 width=280) (actual time=0.009..0.019 rows=5 loops=1)	
7 Planning Time: 30.914 ms	
8 Execution Time: 9.751 ms	

//Select query with aggregation

EXPLAIN ANALYZE SELECT MAX(SALARY) , MIN(SALARY) , AVG(SALARY) FROM SOLDIERS

```
415
416 //Select query with aggregation
417 EXPLAIN ANALYZE SELECT MAX(SALARY) , MIN(SALARY) , AVG(SALARY) FROM SOLDIERS
418
419
420
421
```

Data Output Explain Messages Notifications

QUERY PLAN	
text	
1 Aggregate (cost=1.21..1.22 rows=1 width=40) (actual time=6.785..6.786 rows=1 loops=1)	
2 [...] -> Seq Scan on soldiers (cost=0.00..1.12 rows=12 width=4) (actual time=0.010..0.014 rows=12 loops=1)	
3 Planning Time: 0.162 ms	
4 Execution Time: 6.815 ms	

//EXPLAIN INDEX

EXPLAIN SELECT * FROM SOLDIERS WHERE SSNO < 604 ORDER BY SSNO;

```
377 //INDEXING (05/04/2022)
378
379
380
381
382 EXPLAIN SELECT * FROM SOLDIERS WHERE SSNO < 604 ORDER BY SSNO;
383 QUERY PLAN
384
385 Sort (cost=15.53..15.73 rows=80 width=306)
386 Sort Key: SSNO
387 -> Seq Scan on SOLDIERS (cost=0.00..13.00 rows=80 width=306)
388 Filter: (SSNO < 604)
389 [4 rows]
390
391
```

Data Output Explain Messages Notifications

QUERY PLAN	
text	
1 Sort (cost=15.53..15.73 rows=80 width=306)	
2 [...] Sort Key: ssno	
3 [...] -> Seq Scan on soldiers (cost=0.00..13.00 rows=80 width=306)	
4 [...] Filter: (ssno < 604)	



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//PRIMARY KEY

EXPLAIN ANALYZE SELECT SSNO FROM SOLDIERS

418	
419	//PRIMARY KEY
420	EXPLAIN ANALYZE SELECT SSNO FROM SOLDIERS
421	

Data Output	Explain	Messages	Notifications
QUERY PLAN			
text			
1	Seq Scan on soldiers (cost=0.00..1.12 rows=12 width=4) (actual time=0.009..0.010 rows=12 loops=1)		
2	Planning Time: 0.074 ms		
3	Execution Time: 0.018 ms		

//SECONDARY KEY

EXPLAIN ANALYZE SELECT NAME FROM SOLDIERS

422	//SECONDARY KEY
423	EXPLAIN ANALYZE SELECT NAME FROM SOLDIERS
424	

Data Output	Explain	Messages	Notifications
QUERY PLAN			
text			
1	Seq Scan on soldiers (cost=0.00..1.12 rows=12 width=118) (actual time=0.014..0.015 rows=12 loops=1)		
2	Planning Time: 0.077 ms		
3	Execution Time: 0.028 ms		

//FOREIGN KEY

CREATE INDEX INDEX2 ON DEPARTMENT(DNAME)

EXPLAIN ANALYZE SELECT DNAME FROM DEPARTMENT

428	
429	//FOREIGN KEY
430	CREATE INDEX INDEX2 ON DEPARTMENT(DNAME)
431	EXPLAIN ANALYZE SELECT DNAME FROM DEPARTMENT
432	

Data Output	Explain	Messages	Notifications
QUERY PLAN			
text			
1	Seq Scan on department (cost=0.00..13.30 rows=330 width=104) (actual time=0.028..0.029 rows=10 loops=1)		
2	Planning Time: 21.575 ms		
3	Execution Time: 0.042 ms		



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//COMPOSITE KEY

```
433 //COMPOSITE KEY
434 CREATE INDEX INDEX4 ON DEPARTMENT (DNAME, DRNO)
435 EXPLAIN ANALYZE SELECT DNAME, DRNO FROM DEPARTMENT
```

Data Output Explain Messages Notifications

QUERY PLAN		
	text	
1	Seq Scan on department (cost=0.00..1.10 rows=10 width=108) (actual time=0.013..0.015 rows=10 loops=1)	
2	Planning Time: 1.524 ms	
3	Execution Time: 0.027 ms	