

```
`EXPLAIN ANALYZE SELECT NAME FROM customer WHERE address = '2579 Joel  
Green Suite 253 North Russell, PA 40970';`
```

No limit E

Query Query History Scratch

```
1 EXPLAIN ANALYZE SELECT NAME FROM customer WHERE address = '2579 Joel Green Suite 253 North Russell, PA 40970';
```

Data Output Messages Notifications

	QUERY PLAN	
	text	
1	Index Scan using customer_address_hash on customer (cost=0.00..8.02 rows=1 width=14) (actual time=0.030..0.030 rows=0 loops=...)	
2	Index Cond: (address = '2579 Joel Green Suite 253 North Russell, PA 40970'::text)	
3	Planning Time: 6.760 ms	
4	Execution Time: 0.050 ms	

Query:

```
`CREATE INDEX customer_name_btree ON customer USING btree(name);  
CREATE INDEX customer_address_hash ON customer USING hash(address);  
EXPLAIN ANALYZE SELECT NAME FROM customer WHERE address = '2579 Joel Green  
Suite 253 North Russell, PA 40970';  
-- Index Scan using customer_address_hash on customer (cost=0.00..8.02 rows=1  
width=14) (actual time=0.329..0.330 rows=0 loops=1)`
```

The screenshot shows a database query editor interface. The top toolbar includes icons for file operations, query execution, and settings. The main editor area contains the following SQL query:

```
1 CREATE INDEX customer_name_btree ON customer USING btree(name);  
2 CREATE INDEX customer_address_hash ON customer USING hash(address);  
3 EXPLAIN ANALYZE SELECT NAME FROM customer WHERE address = '2579 Joel Green Suite 253 North Russell, PA 40970';  
4
```

Below the query editor, the 'Data Output' tab is active, displaying the 'QUERY PLAN' for the executed query. The plan consists of four steps:

Step	Operation
1	Index Scan using customer_address_hash on customer (cost=0.00..8.02 rows=1 width=14) (actual time=0.016..0.017 rows=0 loops=1)
2	Index Cond: (address = '2579 Joel Green Suite 253 North Russell, PA 40970')::text)
3	Planning Time: 0.192 ms
4	Execution Time: 0.042 ms

adding indexes improved the performance of queries that use the indexed columns. In contrast, queries that do not use the indexed columns may not have a noticeable improvement in performance or may even be slower due to the additional overhead of maintaining the indexes.

Task2: