

# Tutorials 5 and 6

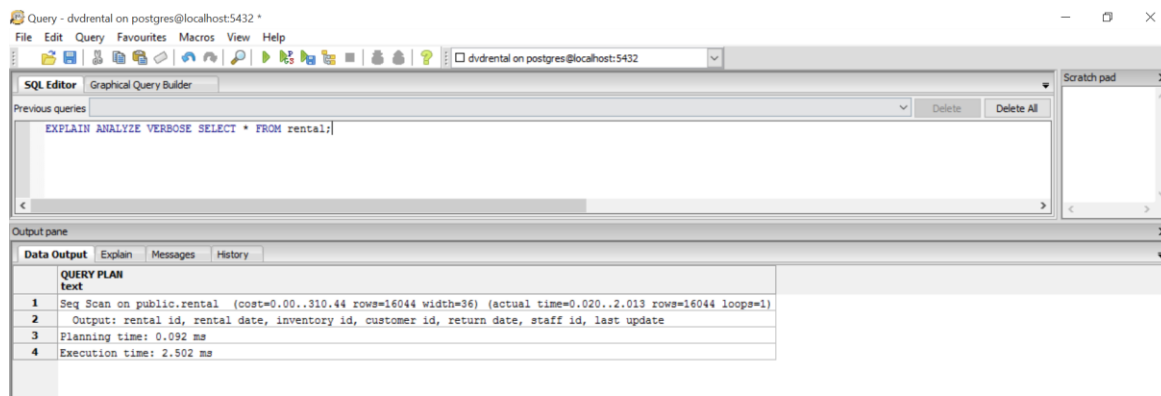
PostgreSQL uses EXPLAIN command to show the execution plan PostgreSQL planner generates for a given SQL statement: (See link: [www.postgresql.org/docs/9.6/static/sql-explain.html](http://www.postgresql.org/docs/9.6/static/sql-explain.html) ). The EXPLAIN command can be combined with ANALYZE and VERBOSE options, and FORMAT in some cases. Connect to “dvdrental” database and try the subsequent commands in the SQL editor tool:

## Tutorial 5

1. Try to retrieve all the rows and columns from “rental” table, one of the biggest table in the database. Try this query:

```
EXPLAIN ANALYZE VERBOSE SELECT * FROM rental;
```

The command will show the query plan for executing this query



You may try other variations of this command:

- i. EXPLAIN SELECT \* FROM rental;
- ii. EXPLAIN ANALYZE SELECT \* FROM rental;
- iii. EXPLAIN VERBOSE SELECT \* FROM rental;

2. Now try a more conditional SQL query that contains join and value checking operations. Also try a more visual form of EXPLAIN command. The following query retrieves all records and columns from “rental” and “customer” tables that concern a customer with first name “Rebecca”. The number of rows in “rental” and “customer” tables are 16044 and 599 respectively. The customer Rebecca has 24 DVD renting records. The result of the query is presented in the next page.

```
SELECT * FROM rental r, customer c WHERE r.customer_id = c.customer_id AND c.first_name = 'Rebecca';
```

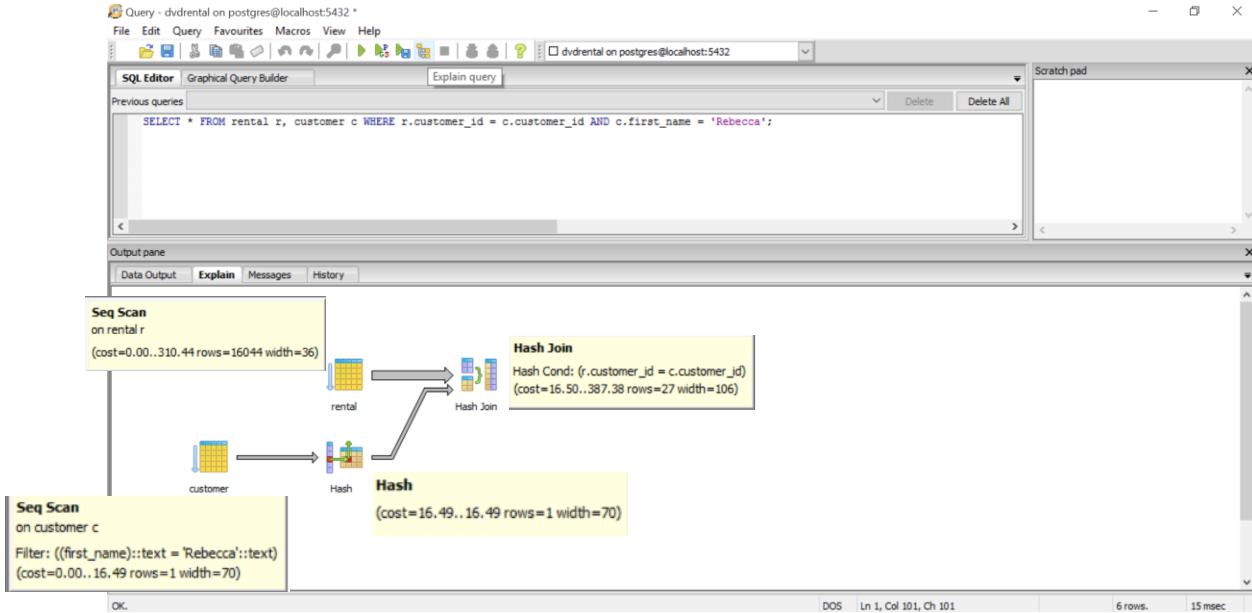
The screenshot shows a PostgreSQL SQL Editor window titled "Query - dvdrental on postgres@localhost:5432". The SQL Editor tab is active, displaying the query: `SELECT * FROM rental r, customer c WHERE r.customer_id = c.customer_id AND c.first_name = 'Rebecca';`. The Output pane at the bottom shows the results of the query, which are 24 rows of data. The results are displayed in a table with the following columns: rental\_id, rental\_date, inventory\_id, customer\_id, return\_date, staff\_id, last\_update, customer\_id, store\_id, first\_name, last\_name, and email. The first 16 rows are visible in the screenshot.

rental_id	rental_date	inventory_id	customer_id	return_date	staff_id	last_update	customer_id	store_id	first_name	last_name	email
1	2005-06-17 04:29:58	1425	34	2005-06-21 05:58:58	1	2006-02-16 02:30:53	34	2	Rebecca	Scott	rebe
2	2005-06-18 05:29:52	2846	34	2005-06-22 00:19:52	1	2006-02-16 02:30:53	34	2	Rebecca	Scott	rebe
3	2005-06-20 20:35:28	94	34	2005-06-26 01:01:28	1	2006-02-16 02:30:53	34	2	Rebecca	Scott	rebe
4	2005-07-06 00:24:25	2381	34	2005-07-10 05:38:25	2	2006-02-16 02:30:53	34	2	Rebecca	Scott	rebe
5	2005-07-06 20:09:11	4548	34	2005-07-08 23:53:11	1	2006-02-16 02:30:53	34	2	Rebecca	Scott	rebe
6	2005-07-09 10:22:31	3265	34	2005-07-13 04:41:31	1	2006-02-16 02:30:53	34	2	Rebecca	Scott	rebe
7	2005-07-10 06:49:00	796	34	2005-07-14 01:53:00	1	2006-02-16 02:30:53	34	2	Rebecca	Scott	rebe
8	2005-07-10 21:32:06	120	34	2005-07-19 21:35:06	1	2006-02-16 02:30:53	34	2	Rebecca	Scott	rebe
9	2005-07-27 02:15:01	376	34	2005-07-28 07:46:01	2	2006-02-16 02:30:53	34	2	Rebecca	Scott	rebe
10	2005-07-27 06:09:30	3449	34	2005-08-02 09:31:30	1	2006-02-16 02:30:53	34	2	Rebecca	Scott	rebe
11	2005-07-27 21:20:52	677	34	2005-07-30 21:38:52	1	2006-02-16 02:30:53	34	2	Rebecca	Scott	rebe
12	2005-07-30 11:17:33	183	34	2005-08-06 15:16:33	2	2006-02-16 02:30:53	34	2	Rebecca	Scott	rebe
13	2005-08-01 11:52:32	2408	34	2005-08-02 10:47:32	1	2006-02-16 02:30:53	34	2	Rebecca	Scott	rebe
14	2005-08-01 14:58:14	2639	34	2005-08-02 13:35:14	1	2006-02-16 02:30:53	34	2	Rebecca	Scott	rebe
15	2005-08-02 08:05:19	1436	34	2005-08-04 07:28:19	2	2006-02-16 02:30:53	34	2	Rebecca	Scott	rebe
16	2005-08-16 23:18:47	3344	34	2005-08-23 19:52:47	2	2006-02-16 02:30:53	34	2	Rebecca	Scott	rebe

To visualize the EXPLAIN command of the above query, in the tool bar of the SQL editor there is



this icon, click on it. It will show the query plan tree in the “Explain” tab of the “Output pane”. Hover over each node of the tree to see the query plan details.



In the “Data Output” tab, you will see a textual description of the query plan:

The screenshot shows the same SQL editor with the "Data Output" tab selected in the "Output pane". It displays a textual representation of the query plan:

QUERY PLAN
1 Hash Join (cost=16.50..387.38 rows=27 width=106)
2 Hash Cond: (r.customer_id = c.customer_id)
3 -> Seq Scan on rental r (cost=0.00..310.44 rows=16044 width=36)
4 -> Hash (cost=16.49..16.49 rows=1 width=70)
5 -> Seq Scan on customer c (cost=0.00..16.49 rows=1 width=70)
6 Filter: ((first_name)::text = 'Rebecca')::text

## Tutorial 6: PostgreSQL views

Try the exercises on PostgreSQL views provided in this link:

<http://www.postgresqltutorial.com/postgresql-views/>