

Analytics Engineer Interviews: Take Home

The following is the take-home assignment for the Warp Analytics Engineer Role. It should not take more than 2 hours. **When finished, please submit your write-up via the Greenhouse submission link in the email containing this prompt. We'd love to review your submission within 1 week.**

Prompt

Imagine it is your first few months at Warp. The growth team is trying to break down their monthly usage numbers into 4 categories:

Usage Categories

- New User
 - **Definition:** A user who is using Warp within the same month of their account creation.
- Retained User
 - **Definition:** A user who is using Warp and also used Warp the previous month.
- Resurrected User
 - **Definition:** A user who is using Warp but did not use Warp the previous month (and is not a new user).
- Churned User
 - **Definition:** A user who used Warp the previous month but did not use Warp in the current month.

Usage Definition

Anyone who has executed a command in Warp in a given month.

The growth team has 2 tables that are useful for performing this analysis.

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Users

A table listing all users with metadata about each account

Columns

* **user_id (string):** Unique user identifier
* **account_created_timestamp (timestamp):** Timestamp of account creation

* **role (string):** frontend | devops | backend

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Command Executions

A table listing each instance of command execution within the Warp Terminal

* **user_id (string):** Unique user identifier

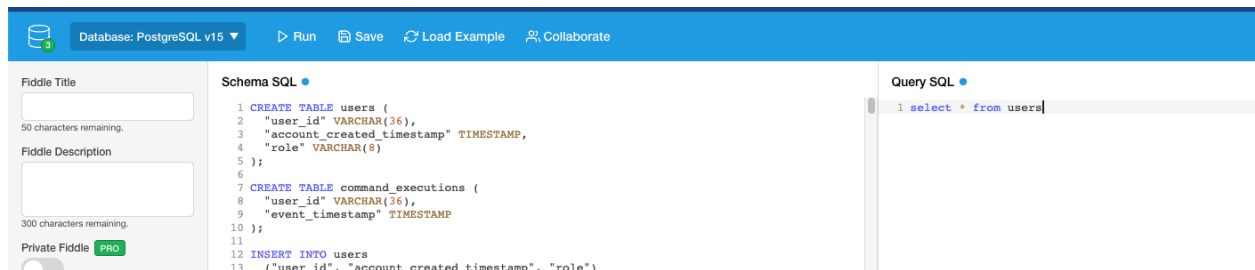
* **event_timestamp (timestamp):** Timestamp of command execution

Development Environment

Please use the following data to answer your questions:

[Data Tables DDL \(Postgres\)](#)

You can copy paste the DDL into [DB Fiddle](#) (online DB playground) to test your SQL against the data and save your answers (make sure you've set the DB fiddle to Postgres)



The screenshot shows the DB Fiddle interface with the following sections:

- Database:** PostgreSQL v15
- Schema SQL:**

```
1 CREATE TABLE users (  
2   "user_id" VARCHAR(36),  
3   "account_created_timestamp" TIMESTAMP,  
4   "role" VARCHAR(8)  
5 );  
6  
7 CREATE TABLE command_executions (  
8   "user_id" VARCHAR(36),  
9   "event_timestamp" TIMESTAMP  
10 );  
11  
12 INSERT INTO users  
13 ("user_id", "account created timestamp", "role")
```
- Query SQL:**

```
1 select * from users
```

[Here is the raw data as well \(csv format\)](#)

Questions

1. Please write a SQL query to report out new users, retained users, resurrected users, and churned users by month from January through December 2022.
 - a. Please have your SQL query organize your response as follows.

Month	New	Retained	Resurrected	Churned
January 1, 2022	100	2334	267	311
...

- b. Please also copy paste the results as a table (should just be 12 rows) into your submission
2. Please create a graph that represents this information in a helpful way. Feel free to use Excel or any other visualization tool.
 3. You may have noticed that answering this question involves a lot of joining and grouping! Please suggest **ONE intermediate table** to help less SQL-adept Warp employees answer questions about churn, resurrections, and retention. You don't need to write the SQL for how you'd build this table - just suggest a user-friendly schema and brief explanation for why you think this data model would be helpful for end users. A few sentences is fine!

Here are some questions your teammates might use the new table to answer.

- a. How is our week-over-week / month-over-month retention?
 - b. How is our weekly and monthly retention by role?
 - c. How is our retention by login period (to understand if we are improving retention over time)?
4. Suppose the growth team has noticed that frontend engineers are churning at 3x the rate of backend and devops. The growth team needs to decide whether to allocate resources towards the underperforming segment or double-down on the better performing segments. What are some additional pieces of data/analyses you think would be helpful in making this decision (please brainstorm data beyond the two sample tables we provided)! A short paragraph or two is great.