Data Assessment

- **Context**
    1. **User data** is stored in **CockroachDB** in the `users` table, containing fields like `id` (UUID), `created_at` (signup timestamp), and `last_active` (timestamp of the last activity).
    2. **Message activity** is stored in SQL in the `conversations` and `messages` tables. The `messages` table tracks individual messages sent by users, with each message linked to a specific `conversation_id` and `user_id`.
    3. **Payment data** is stored in an external stream or collection (e.g., MongoDB), with each transaction containing a `user_id`, `payment_amount`, and `transaction_date`.● We define an **active user** as someone who has:
        1. Sent at least one message (from the `messages` table).
- Additionally we want to track **active paying user** as someone who has both:
    1. Sent at least one message (from the `messages` table) AND
    2. Made at least one payment (from the payment stream).
- We want to calculate:
    1. **Total revenue** generated by users who signed up in the last 30 days.
    2. The **30-day total conversion rate**, i.e., the percentage of users who signed up in the last 30 days and either made a payment or sent a message within that period.
    3. The **30-day retention rate**, i.e., the percentage of users who continue to make another payment **30 days after their initial sign-up or purchase**

Tangible Deliverables

- **Extract user data**: Write a SQL query to extract the `id`, `created_at`, and `last_active` from the `users` table for users who signed up in the last 30 days.● **Integrate payment stream data**: Write a SQL query or Python script to join the **user data** from the `users` table with the **payment transaction stream**. Calculate the **total revenue** generated by users who signed up in the last 30 days and made a payment during that time.
- **Track message activity**: Write a SQL query to identify active users based on messages. Specifically:
    1. Count distinct users who have sent at least one message in the last 30 days.
- **Calculate the 30-day conversion rate**: i.e., what percentage of users who signed up in the last 30 days made at least one payment or sent a message. Assume last_active does not cover this case
- **Calculate the 30-day retention rate:** percentage of users who continue to engage with the product **30 days after their initial sign-up or purchase** Assume last_active does not cover this case

1. For this example let's just define engagement as another payment within **30 days after their initial sign-up or purchase**

Open Ended Deliverables

1. Using any tool of your choice, describe or create a simple dashboard that can easily view and drill down into these metrics?
    - Feel free to create the dashboard to showcase expertise, but an in-depth explanation of exact steps you would take will also suffice
2. If you are to run an A/B test, and the feature is to be rolled out to 50% of new users / 50% control, how would you evaluate its effect on 30-day total conversion rate and 30-day retention rate?
    - Please explain briefly. We'll go over the assessment and understanding in a follow up.