□□□□□□□□□□□□□□□□□□□□□□□□□□□□ SQL □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

Q1: □□ 2020 □□□□□□□□ `spam_indicator = 0` □□□□□□□□□□□□□□□□□□□□Ad Load□

□□□□

□□□□□□□□□□□□□□□ `ad_load` □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

1. □□□ (`country`) □□□ (`dt`) □□□
2. □□□□□□□□□□ `spam_indicator = 0` □□
3. □□□□□□□□ 2020 □□

□□□□**SQL**□□

```sql
WITH AdImpressions AS (
    -- Step 1: □□□□□□□□□□□□□□□
    SELECT
        ud.country,
        pi.dt AS calendar_date,
        CASE WHEN pp.advertiser_id IS NOT NULL THEN 1 ELSE 0 END AS is_ad
    FROM pin_impressions pi
    LEFT JOIN promoted_pins pp
        ON pi.pin_id = pp.pin_id AND pi.dt = pp.dt
    JOIN user_dimension ud
        ON pi.user_id = ud.user_id
    WHERE ud.spam_indicator = 0
      AND TO_DATE(pi.dt) BETWEEN TO_DATE('2020-01-01') AND TO_DATE('2020-12-31')
),
AdLoadByCountryDay AS (
    -- Step 2: □□□□□□□□□□□□□□□□□
    SELECT
        country,
        calendar_date,
        SUM(is_ad) AS ad_count,          -- □□□□□□
        COUNT(*) AS total_count,         -- □□□□□
        SUM(is_ad) / COUNT(*) AS ad_load -- □□□□□□
    FROM AdImpressions
    GROUP BY country, calendar_date
)
-- Step 3: □□□□□□
SELECT
    country,
    calendar_date,
    ad_load
FROM AdLoadByCountryDay
ORDER BY country, calendar_date;
```

□□□□

1. **AdImpressions CTE**:
    - □ `pin_impressions` □□ `promoted_pins` □□□ `LEFT JOIN` □□□□□□□□□□□□□□□□ `CASE WHEN` □□ `advertiser_id` □□□□□□
    - □□□ `user_dimension` □□□□□□□□□□□□□□ `spam_indicator = 0` □□

- □□□□□□□ 2020 □□

2. **AdLoadByCountryDay CTE**:
   - □□□□□□□□□□□□□□□□□□ `SUM(is_ad)` □□□□□□□□ `COUNT(*)` □□
   - □□□□□□□□□ `SUM(is_ad) / COUNT(*)` □

3. □□□□:
   - □□□□□□□□□□□□□□□□□□□□□□□□□□

Q2: □□□□□□□□□□□□□□□□□

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□□ Q1 □□

□□□□**SQL**□□

```sql
WITH AdLoad AS (
    -- Step 1: □□ Q1 □□□
    SELECT
        ud.country,
        pi.dt AS calendar_date,
        SUM(CASE WHEN pp.advertiser_id IS NOT NULL THEN 1 ELSE 0 END) / COUNT(*) AS
ad_load
    FROM pin_impressions pi
    LEFT JOIN promoted_pins pp
        ON pi.pin_id = pp.pin_id AND pi.dt = pp.dt
    JOIN user_dimension ud
        ON pi.user_id = ud.user_id
    WHERE ud.spam_indicator = 0
      AND TO_DATE(pi.dt) BETWEEN TO_DATE('2020-01-01') AND TO_DATE('2020-12-31')
    GROUP BY ud.country, pi.dt
),
TodayVsYesterday AS (
    -- Step 2: □□□□□□□□□□□□□□□□□□□□□
    SELECT
        t.country,
        t.calendar_date AS today_date,
        y.calendar_date AS yesterday_date,
        t.ad_load AS today_ad_load,
        y.ad_load AS yesterday_ad_load
    FROM AdLoad t
    JOIN AdLoad y
        ON t.country = y.country
       AND DATEDIFF(t.calendar_date, y.calendar_date) = 1
    WHERE t.ad_load > y.ad_load
)
-- Step 3: □□□□□□
SELECT
    country,
    today_date,
    today_ad_load,
```

```
    yesterday_ad_load
FROM TodayVsYesterday
WHERE today_date = CURRENT_DATE;
```

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1. **AdLoad CTE**:
    - □□□□ Q1 □□□□□□□□□□□□□□□□□□□□□□□□
2. **TodayVsYesterday CTE**:
    - □□□□□□□ JOIN □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□
    - □□□□ DATEDIFF(t.calendar_date, y.calendar_date) = 1 □□□□□□□□□□□□□□□□□□□
    - □□□□□□□□□□□□□□□□□□□□□□
3. □□□□:
    - □□□
    - □□□□□□□□□□□□□□□□□□□ CURRENT_DATE □□

Transaction □□ Dense Rank □□

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□□□□□□□□□ Transaction □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ dense_rank □□□□□□□□ MM/DD/YYYY □

□□□□**SQL**□□

```
WITH RankedTransactions AS (
    -- Step 1: □□□□□□□□□□□□
    SELECT
        CustomerID,
        Date,
        STR_TO_DATE(Date, '%m/%d/%Y') AS formatted_date, -- □□□□□□□□□□□
        DENSE_RANK() OVER (PARTITION BY CustomerID ORDER BY STR_TO_DATE(Date,
'%m/%d/%Y')) AS rank
    FROM Transaction
)
-- Step 2: □□□□
SELECT
    CustomerID,
    Date,
    formatted_date,
    rank
FROM RankedTransactions
ORDER BY CustomerID, rank;
```

□□□□

1. **RankedTransactions CTE**:
    - □□ STR_TO_DATE □□□□□□□□□□□□□□□ MM/DD/YYYY □□□□□□□□□□□□□□□
    - □□ DENSE_RANK() □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□
    - PARTITION BY CustomerID □□□□□□□□□ ORDER BY STR_TO_DATE(Date, '%m/%d/%Y') □□□□□□□□□

2. □□□□:

    - □□□□□□□□□□□□□□□□□□□
    - □□□ ID □□□□□□□□□□□□□

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- **CTE** □□□□CTE□Common Table Expressions□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□
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