Problem 3673: Find Zombie Sessions

Problem Information

Difficulty: Hard
Acceptance Rate: 49.75%
Paid Only: No

Problem Description

Table: `app_events`

+------------------+----------+ | Column Name | Type | +------------------+----------+ | event_id | int | | user_id | int | | event_timestamp | datetime | | event_type | varchar | | session_id | varchar | | event_value | int | +------------------+----------+ event_id is the unique identifier for this table. event_type can be app_open, click, scroll, purchase, or app_close. session_id groups events within the same user session. event_value represents: for purchase - amount in dollars, for scroll - pixels scrolled, for others - NULL.

Write a solution to identify **zombie sessions, **sessions where users appear active but show abnormal behavior patterns. A session is considered a **zombie session** if it meets ALL the following criteria:

* The session duration is **more than** `30` minutes. * Has **at least** `5` scroll events. * The **click-to-scroll ratio** is less than `0.20` . * **No purchases** were made during the session.

Return _the result table ordered by_ `scroll_count` _in**descending** order, then by_ `session_id` _in**ascending** order_.

The result format is in the following example.

Example:

Input:

app_events table:

+----------+---------+--------------------+------------+------------+-------------+ | event_id | user_id | event_timestamp | event_type | session_id | event_value | +----------+---------+--------------------+------------+------------+-------------+ | 1 | 201 | 2024-03-01 10:00:00 | app_open | S001 | NULL | | 2 | 201 | 2024-03-01 10:05:00 | scroll | S001 | 500 | | 3 | 201 | 2024-03-01 10:10:00 | scroll | S001 | 750 | | 4 | 201 | 2024-03-01 10:15:00 | scroll | S001 | 600 | | 5 | 201 | 2024-03-01 10:20:00 | scroll | S001 | 800 | | 6 | 201 | 2024-03-01 10:25:00 | scroll | S001 | 550 | | 7 | 201 | 2024-03-01 10:30:00 | scroll | S001 | 900 | | 8 | 201 | 2024-03-01 10:35:00 | app_close | S001 | NULL | | 9 | 202 | 2024-03-01 11:00:00 | app_open | S002 | NULL | | 10 | 202 | 2024-03-01 11:02:00 | click | S002 | NULL | | 11 | 202 | 2024-03-01 11:05:00 | scroll | S002 | 400 | | 12 | 202 | 2024-03-01 11:08:00 | click | S002 | NULL | | 13 | 202 | 2024-03-01 11:10:00 | scroll | S002 | 350 | | 14 | 202 | 2024-03-01 11:15:00 | purchase | S002 | 50 | | 15 | 202 | 2024-03-01 11:20:00 | app_close | S002 | NULL | | 16 | 203 | 2024-03-01 12:00:00 | app_open | S003 | NULL | | 17 | 203 | 2024-03-01 12:10:00 | scroll | S003 | 1000 | | 18 | 203 | 2024-03-01 12:20:00 | scroll | S003 | 1200 | | 19 | 203 | 2024-03-01 12:25:00 | click | S003 | NULL | | 20 | 203 | 2024-03-01 12:30:00 | scroll | S003 | 800 | | 21 | 203 | 2024-03-01 12:40:00 | scroll | S003 | 900 | | 22 | 203 | 2024-03-01 12:50:00 | scroll | S003 | 1100 | | 23 | 203 | 2024-03-01 13:00:00 | app_close | S003 | NULL | | 24 | 204 | 2024-03-01 14:00:00 | app_open | S004 | NULL | | 25 | 204 | 2024-03-01 14:05:00 | scroll | S004 | 600 | | 26 | 204 | 2024-03-01 14:08:00 | scroll | S004 | 700 | | 27 | 204 | 2024-03-01 14:10:00 | click | S004 | NULL | | 28 | 204 | 2024-03-01 14:12:00 | app_close | S004 | NULL | +----------+---------+--------------------+------------+------------+-------------+

Output:

+------------+---------+-------------------------+--------------+ | session_id | user_id | session_duration_minutes | scroll_count | +------------+---------+-------------------------+--------------+ | S001 | 201 | 35 | 6 | +------------+---------+-------------------------+--------------+

Explanation:

* **Session S001 (User 201)** : * Duration: 10:00:00 to 10:35:00 = 35 minutes (more than 30) * Scroll events: 6 (at least 5) * Click events: 0 * Click-to-scroll ratio: 0/6 = 0.00 (less than 0.20) * Purchases: 0 (no purchases) * S001 is a zombie session (meets all criteria) * **Session S002 (User 202)** : * Duration: 11:00:00 to 11:20:00 = 20 minutes (less than 30) * Has a purchase event * S002 is not a zombie session * **Session S003 (User 203)** : * Duration: 12:00:00 to 13:00:00 = 60 minutes (more than 30) * Scroll events: 5 (at least 5) * Click events: 1 * Click-to-scroll ratio: 1/5 = 0.20 (not less than 0.20) * Purchases: 0 (no purchases) * S003 is not a zombie session (click-to-scroll ratio equals 0.20, needs to be less) * **Session S004 (User 204)** : * Duration: 14:00:00 to 14:12:00 = 12 minutes (less than 30) * Scroll events: 2 (less than 5) * S004 is not a zombie session

The result table is ordered by scroll_count in descending order, then by session_id in ascending order.

Code Snippets

MySQL:

```
# Write your MySQL query statement below
```

MS SQL Server:

```
/* Write your T-SQL query statement below */
```

PostgreSQL:

```
-- Write your PostgreSQL query statement below
```