Problem 3214: Year on Year Growth Rate

Problem Information

Difficulty: Hard
Acceptance Rate: 50.75%
Paid Only: Yes
Tags: Database

Problem Description

Table: `user_transactions`

+------------------+----------+ | Column Name | Type | +------------------+----------+ | transaction_id | integer | | product_id | integer | | spend | decimal | | transaction_date | datetime | +------------------+----------+ The transaction_id column uniquely identifies each row in this table. Each row of this table contains the transaction ID, product ID, the spend amount, and the transaction date.

Write a solution to calculate the **year-on-year growth rate** for the total spend **for each product**.

The result table should include the following columns:

* `year`: The year of the transaction. * `product_id`: The ID of the product. * `curr_year_spend`: The total spend for the current year. * `prev_year_spend`: The total spend for the previous year. * `yoy_rate`: The year-on-year growth rate percentage, rounded to `2` decimal places.

Return _the result table ordered by_ `product_id`,`year` _in**ascending** order_.

The result format is in the following example.

Example:

Input:

`user_transactions` table:

+----------------+------------+---------+--------------------+ | transaction_id | product_id | spend | transaction_date | +----------------+------------+---------+--------------------+ | 1341 | 123424 | 1500.60 | 2019-12-31 12:00:00 | | 1423 | 123424 | 1000.20 | 2020-12-31 12:00:00 | | 1623 | 123424 | 1246.44 | 2021-12-31 12:00:00 | | 1322 | 123424 | 2145.32 | 2022-12-31 12:00:00 | +----------------+------------+---------+--------------------+

Output:

+------+------------+---------------+---------------+----------+ | year | product_id | curr_year_spend| prev_year_spend| yoy_rate | +------+------------+---------------+---------------+----------+ | 2019 | 123424 | 1500.60 | NULL | NULL | | 2020 | 123424 | 1000.20 | 1500.60 | -33.35 | | 2021 | 123424 | 1246.44 | 1000.20 | 24.62 | | 2022 | 123424 | 2145.32 | 1246.44 | 72.12 | +------+------------+---------------+---------------+----------+

Explanation:

* For product ID 123424: * In 2019: * Current year's spend is 1500.60 * No previous year's spend recorded * YoY growth rate: NULL * In 2020: * Current year's spend is 1000.20 * Previous year's spend is 1500.60 * YoY growth rate: ((1000.20 - 1500.60) / 1500.60) * 100 = -33.35% * In 2021: * Current year's spend is 1246.44 * Previous year's spend is 1000.20 * YoY growth rate: ((1246.44 - 1000.20) / 1000.20) * 100 = 24.62% * In 2022: * Current year's spend is 2145.32 * Previous year's spend is 1246.44 * YoY growth rate: ((2145.32 - 1246.44) / 1246.44) * 100 = 72.12%

Note: Output table is ordered by `product_id` and `year` 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
```