Problem 3421: Find Students Who Improved

Problem Information

Difficulty: Medium
Acceptance Rate: 0.00%
Paid Only: No

Problem Description

Table:

Scores

+-------------+---------+ | Column Name | Type | +-------------+---------+ | student_id | int | | subject | varchar | | score | int | | exam_date | varchar | +-------------+---------+ (student_id, subject, exam_date) is the primary key for this table. Each row contains information about a student's score in a specific subject on a particular exam date. score is between 0 and 100 (inclusive).

Write a solution to find the

students who have shown improvement

. A student is considered to have shown improvement if they meet

both

of these conditions:

Have taken exams in the

same subject

on at least two different dates

Their

latest score

in that subject is

higher

than their

first score

Return

the result table

ordered by

student_id,

subject

in

ascending

order

.

The result format is in the following example.

Example:

Input:

Scores table:

+------------+----------+-------+------------+ | student_id | subject | score | exam_date | +------------+----------+-------+------------+ | 101 | Math | 70 | 2023-01-15 | | 101 | Math | 85 | 2023-02-15 | | 101 | Physics | 65 | 2023-01-15 | | 101 | Physics | 60 | 2023-02-15 | | 102 | Math

| 80 | 2023-01-15 | | 102 | Math | 85 | 2023-02-15 | | 103 | Math | 90 | 2023-01-15 | | 104 | Physics | 75 | 2023-01-15 | | 104 | Physics | 85 | 2023-02-15 |
+------------+----------+-------+------------+

Output:

+------------+----------+-------------+--------------+ | student_id | subject | first_score | latest_score |
+------------+----------+-------------+--------------+ | 101 | Math | 70 | 85 | | 102 | Math | 80 | 85 | | 104 | Physics | 75 | 85 | +------------+----------+-------------+--------------+

Explanation:

Student 101 in Math: Improved from 70 to 85

Student 101 in Physics: No improvement (dropped from 65 to 60)

Student 102 in Math: Improved from 80 to 85

Student 103 in Math: Only one exam, not eligible

Student 104 in Physics: Improved from 75 to 85

Result table is ordered by student_id, subject.

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
```

Oracle:

```
/* Write your PL/SQL query statement below */
```

Pandas:

```
import pandas as pd

def find_students_who_improved(scores: pd.DataFrame) -> pd.DataFrame:
```

Solutions

MySQL Solution:

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