Problem 3156: Employee Task Duration and Concurrent Tasks

Problem Information

Difficulty: Hard
Acceptance Rate: 38.94%
Paid Only: Yes
Tags: Database

Problem Description

Table: `Tasks`

+---------------+----------+ | Column Name | Type | +---------------+----------+ | task_id | int | | employee_id | int | | start_time | datetime | | end_time | datetime | +---------------+----------+ (task_id, employee_id) is the primary key for this table. Each row in this table contains the task identifier, the employee identifier, and the start and end times of each task.

Write a solution to find the **total duration** of tasks for **each** employee and the **maximum number of concurrent tasks** an employee handled at **any point in time**. The total duration should be **rounded down** to the nearest number of **full hours**.

Return _the result table ordered by_ `employee_id`**_ascending_** _order_.

The result format is in the following example.

Example:

Input:

Tasks table:

+---------+-------------+---------------------+---------------------+ | task_id | employee_id | start_time | end_time | +---------+-------------+---------------------+---------------------+ | 1 | 1001 | 2023-05-01 08:00:00 | 2023-05-01 09:00:00 | | 2 | 1001 | 2023-05-01 08:30:00 | 2023-05-01 10:30:00 | | 3 | 1001 | 2023-05-01 11:00:00 | 2023-05-01 12:00:00 | | 7 | 1001 | 2023-05-01 13:00:00 |

2023-05-01 15:30:00 | | 4 | 1002 | 2023-05-01 09:00:00 | 2023-05-01 10:00:00 | | 5 | 1002 | 2023-05-01 09:30:00 | 2023-05-01 11:30:00 | | 6 | 1003 | 2023-05-01 14:00:00 | 2023-05-01 16:00:00 | +---------+-------------+---------------------+---------------------+

Output:

+-------------+-----------------+---------------------+ | employee_id | total_task_hours | max_concurrent_tasks | +-------------+-----------------+---------------------+ | 1001 | 6 | 2 | | 1002 | 2 | 2 | | 1003 | 2 | 1 | +-------------+-----------------+---------------------+

Explanation:

* For employee ID 1001: * Task 1 and Task 2 overlap from 08:30 to 09:00 (30 minutes). * Task 7 has a duration of 150 minutes (2 hours and 30 minutes). * Total task time: 60 (Task 1) + 120 (Task 2) + 60 (Task 3) + 150 (Task 7) - 30 (overlap) = 360 minutes = 6 hours. * Maximum concurrent tasks: 2 (during the overlap period). * For employee ID 1002: * Task 4 and Task 5 overlap from 09:30 to 10:00 (30 minutes). * Total task time: 60 (Task 4) + 120 (Task 5) - 30 (overlap) = 150 minutes = 2 hours and 30 minutes. * Total task hours (rounded down): 2 hours. * Maximum concurrent tasks: 2 (during the overlap period). * For employee ID 1003: * No overlapping tasks. * Total task time: 120 minutes = 2 hours. * Maximum concurrent tasks: 1.

Note: Output table is ordered by employee_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
```