Problem 3401: Find Circular Gift Exchange Chains

Problem Information

Difficulty: Hard
Acceptance Rate: 52.76%
Paid Only: Yes
Tags: Database

Problem Description

Table: `SecretSanta`

+-------------+------+ | Column Name | Type | +-------------+------+ | giver_id | int | | receiver_id | int | | gift_value | int | +-------------+------+ (giver_id, receiver_id) is the unique key for this table. Each row represents a record of a gift exchange between two employees, giver_id represents the employee who gives a gift, receiver_id represents the employee who receives the gift and gift_value represents the value of the gift given.

Write a solution to find the **total gift value** and **length** of**circular chains** of Secret Santa gift exchanges:

A **circular chain** is defined as a series of exchanges where:

* Each employee gives a gift to **exactly one** other employee. * Each employee receives a gift **from exactly** one other employee. * The exchanges form a continuous **loop** (e.g., employee A gives a gift to B, B gives to C, and C gives back to A).

Return _the result ordered by the chain length and total gift value of the chain in **descending** order_.

The result format is in the following example.

Example:

Input:

SecretSanta table:

+----------+-------------+------------+ | giver_id | receiver_id | gift_value |
+----------+-------------+------------+ | 1 | 2 | 20 | | 2 | 3 | 30 | | 3 | 1 | 40 | | 4 | 5 | 25 | | 5 | 4 | 35 |
+----------+-------------+------------+

Output:

+----------+--------------+------------------+ | chain_id | chain_length | total_gift_value |
+----------+--------------+------------------+ | 1 | 3 | 90 | | 2 | 2 | 60 |
+----------+--------------+------------------+

Explanation:

* **Chain 1** involves employees 1, 2, and 3: * Employee 1 gives a gift to 2, employee 2 gives a gift to 3, and employee 3 gives a gift to 1. * Total gift value for this chain = 20 + 30 + 40 = 90. * **Chain 2** involves employees 4 and 5: * Employee 4 gives a gift to 5, and employee 5 gives a gift to 4. * Total gift value for this chain = 25 + 35 = 60.

The result table is ordered by the chain length and total gift value of the chain in descending 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
```