

Problem 3401: Find Circular Gift Exchange Chains

Problem Information

Difficulty: Hard

Acceptance Rate: 0.00%

Paid Only: No

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
```

Oracle:

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

Pandas:

```
import pandas as pd

def find_gift_chains(secret_santa: pd.DataFrame) -> pd.DataFrame:
```

Solutions

MySQL Solution:

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