Problem List

Description | Editorial | Solutions | Accepted | Submissions

# 3052. Maximize Items

Premium

Solved

Hard | Topics | Companies

SQL Schema > Pandas Schema >

Table: `Inventory`

| Column Name | Type |
|---|---|
| item_id | int |
| item_type | varchar |
| item_category | varchar |
| square_footage | decimal |

item_id is the column of unique values for this table.
Each row includes item id, item type, item category and sqaure footage.

Leetcode warehouse wants to maximize the number of items it can stock in a `500,000` square feet warehouse. It wants to stock as many **prime** items as possible, and afterwards use the **remaining** square footage to stock the most number of **non-prime** items.

Write a solution to find the number of **prime** and **non-prime** items that can be **stored** in the `500,000` square feet warehouse. Output the item type with `prime_eligible` followed by `not_prime` and the maximum number of items that can be stocked.

**Note:**

- Item **count** must be a whole number (integer).
- If the count for the **not_prime** category is `0`, you should **output** `0` for that particular category.

Return *the result table ordered by item count in **descending order**.*

The result format is in the following example.

**Example 1:**

**Input:**
Inventory table:

| item_id | item_type | item_category | square_footage |
|---|---|---|---|
| 1374 | prime_eligible | Watches | 68.00 |
| 4245 | not_prime | Art | 26.40 |
| 5743 | prime_eligible | Software | 325.00 |
| 8543 | not_prime | Clothing | 64.50 |
| 2556 | not_prime | Shoes | 15.00 |
| 2452 | prime_eligible | Scientific | 85.00 |
| 3255 | not_prime | Furniture | 22.60 |
| 1672 | prime_eligible | Beauty | 8.50 |
| 4256 | prime_eligible | Furniture | 55.50 |
| 6325 | prime_eligible | Food | 13.20 |

**Output:**

| item_type | item_count |
|---|---|
| prime_eligible | 5400 |
| not_prime | 8 |

**Explanation:**
- The prime-eligible category comprises a total of 6 items, amounting to a combined square footage of 555.20 (68 + 325 + 85 + 8.50 + 55.50 + 13.20). It is possible to store 900 combinations of these 6 items, totaling 5400 items and occupying 499,680 square footage.
- In the not_prime category, there are a total of 4 items with a combined square footage of 128.50. After deducting the storage used by prime-eligible items (500,000 - 499,680 = 320), there is room for 2 combinations of non-prime items, accommodating a total of 8 non-prime items within the available 320 square footage.
Output table is ordered by item count in descending order.

Seen this question in a real interview before? 1/5

Yes | No

Accepted 1,872/2.5K | Acceptance Rate 74.1%

Topics

Companies

Discussion (9)

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Code

Pandas • Auto

```python
import pandas as pd

def maximize_items(inventory: pd.DataFrame) -> pd.DataFrame:

    prime = inventory[inventory.item_type == 'prime_eligible']
    nt_pr = inventory[inventory.item_type == 'not_prime']

    p_sum, p_cnt = sum(prime.square_footage), len(prime)
    n_sum, n_cnt = sum(nt_pr.square_footage), len(nt_pr)

    dp, m = divmod(500_000, p_sum)
    dn = m//n_sum

    return pd.DataFrame({'item_type':['prime_eligible', 'not_prime'],
                         'item_count':[dp * p_cnt, dn * n_cnt] })

```

Saved

Ln 14, Col 59

Testcase | Test Result

Accepted Runtime: 242 ms

Case 1

Input

Inventory =

| item_id | item_type | item_category | square_footage |
|---|---|---|---|
| 1374 | prime_eligible | Watches | 68 |
| 4245 | not_prime | Art | 26.4 |
| 5743 | prime_eligible | Software | 325 |
| 8543 | not_prime | Clothing | 64.5 |
| 2556 | not_prime | Shoes | 15 |
| 2452 | prime_eligible | Scientific | 85 |

7 | 9 | 0 Online