Credit Card Reward Points System

Implement a new Credit Card Rewards Points system.

Background

Capital One has decided to introduce a new purchase promotion campaign based on the credit card purchases at a variety of merchants. As part of this campaign, customers will be awarded monthly rewards points calculated based on the customer's credit card purchases.

The Problem Statement

The aim is to create a rewards calculation system that calculates the total monthly reward points earned based on a customer's credit card purchases. More than one reward points calculation rules could apply to a merchant's transaction(s) and the system should maximize the calculated points for a merchant by considering different priorities or combinations of the rules.

Sample Transactions

Here is a list of transactions for a customer that needs to be considered for your solution.

```
transactions = {
   "T01": {"date": "2021-05-01", "merchant_code" : "sportcheck", "amount_cents":  21000},
   "T02": {"date": "2021-05-02", "merchant_code" : "sportcheck", "amount_cents":  8700},
   "T03": {"date": "2021-05-03", "merchant_code" : "tim_hortons", "amount_cents":  323},
   "T04": {"date": "2021-05-04", "merchant_code" : "tim_hortons", "amount_cents":  1267},
   "T05": {"date": "2021-05-05", "merchant_code" : "tim_hortons", "amount_cents":  2116},
   "T06": {"date": "2021-05-06", "merchant_code" : "tim_hortons", "amount_cents":  2211},
   "T07": {"date": "2021-05-07", "merchant_code" : "subway", "amount_cents":  1853},
   "T08": {"date": "2021-05-08", "merchant_code" : "subway", "amount_cents":  2153},
   "T09": {"date": "2021-05-09", "merchant_code" : "sportcheck", "amount_cents":  7326},
   "T10": {"date": "2021-05-10", "merchant_code" : "tim_hortons", "amount_cents":  1321}
}
```

The Ask

Assuming that each $1 spend is only counted once, implement a method that takes the customer transactions as an input (Merchant Code -> Purchase Amount) and calculates the total maximum rewards points earned for the month , the maximum reward points applied for each transaction.

- Rule 1: 500 points for every $75 spend at Sport Check, $25 spend at Tim Hortons and $25 spend at Subway
- Rule 2: 300 points for every $75 spend at Sport Check and $25 spend at Tim Hortons
- Rule 3: 200 points for every $75 spend at Sport Check
- Rule 4: 150 points for every $25 spend at Sport Check, $10 spend at Tim Hortons and $10 spend at Subway
- Rule 5: 75 points for every $25 spend at Sport Check and $10 spend at Tim Hortons
- Rule 6: 75 point for every $20 spend at Sport Check
- Rule 7: 1 points for every $1 spend for all other purchases (including leftover amount)

Examples

Here are a few examples to help understand how to use rules to calculate the reward points. Each example has a set of transactions and rules to use for reward points calculation. These examples may not necessarily be the solution to the main problem.

Example 1

Transactions:

```
transactions = {
   'T1': {'date': '2021-05-09', 'merchant_code' : 'sportcheck', 'amount_cents':  7326},
   'T2': {'date': '2021-05-10', 'merchant_code' : 'tim_hortons', 'amount_cents':  1321}
}
```

Rules:

- Rule 1: 10 points for every $1 spend at Sport Check

Solution:

- Rule 1: 10 points for every $1 spend at Sport Check
    - Promotion Applied x 73

Total Points: 730
Transaction Level Points:

- T1 - 730
- T2 - 0

Example 2

Transactions:

```
transactions = {
   'T1': {'date': '2021-05-09', 'merchant_code' : 'sportcheck', 'amount_cents':  7326},
   'T2': {'date': '2021-05-10', 'merchant_code' : 'tim_hortons', 'amount_cents':  1321}
}
```

Rules:

- Rule 1: 10 points for every $1 spend at Sport Check
- Rule 2: 100 points for every $5 spend at Sport Check

Solution:

- Rule 1: 10 points for every $1 spend at Sport Check
    - Promotion Applied x 3
- Rule 2: 100 points for every $5 spend at Sport Check
    - Promotion Applied x 14

Total Points: 1430
Transaction Level Points:

- T1 - 1430
- T2 - 0

Example 3

Transactions:

```
transactions = {
   'T1': {'date': '2021-05-09', 'merchant_code' : 'sportcheck', 'amount_cents':  7326},
```

```
  'T2': {'date': '2021-05-10', 'merchant_code' : 'tim_hortons', 'amount_cents':  1321}
}
```

Rules:

- Rule 1: 100 points for every $5 spend at Sport Check
- Rule 2: 10 points for every $1 spend for all other purchases

Solution:

- Rule 1: 100 points for every $5 spend at Sport Check
    - Promotion Applied x 14
- Rule 2: 10 points for every $1 spend for all other purchases (including leftover amount)
    - Promotion Applied x 16

Total Points: 1560
Transaction Level Points:

- T1 - 1430
- T2 - 130

Example 4

Transactions:

```
transactions = {
  'T1': {'date': '2021-05-09', 'merchant_code' : 'sportcheck', 'amount_cents':  2500},
  'T2': {'date': '2021-05-10', 'merchant_code' : 'tim_hortons', 'amount_cents':  1000},
  'T3': {'date': '2021-05-10', 'merchant_code' : 'the_bay', 'amount_cents':  500}
}
```

Rules:

Same rules as stated in the main problem.

Solution:

- Rule 6: 75 point for every $20 spend at Sport Check
    - Promotion Applied x 1
- Rule 7: 1 points for every $1 spend for all other purchases (including leftover amount)
    - Promotion Applied x 20

Total points: 95

Transaction level points:

- T1 - 80 (rule 6 & 7)
- T2 - 10 (rule 7)
- T3 - 5 (rule 7)

Explanation:
Two sets of rules apply to this input

- If you use combination rules 5 and 7, the total points is 80 but that's not the max total that can be achieved.
- If you use combination rules 6 and 7, the total points is 95 which is the correct solution.