Nothing Casual about this dating app

Assignment : Data Analyst @ Aisle

Candidate Details

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Key Instructions:

- **Console interface** is enough.
- Try to write **production quality code** instead of write-once and throw kind of code (refactor into small, recognizable modules, use frameworks where needed to save code, write tests, etc. No need for CI, or scale-out in mind, though.)
- Please use **object oriented design** when designing your code.

Submission Format :

- first problem: share your code via Github. (code : accessible publicly)
- second problem, only the SQL query is required.

Problem 1: Sales Tax

Basic sales tax = 10% on all goods, ***exemptions*** : books, food, and medical products

Import duty = 5% additional sales tax on all imported goods with ***no exemptions***

When I **purchase** items I receive **receipt** which lists **name of items & price (including tax)** , finishing **with total cost of items, & total amounts of sales taxes paid**

rounding rules for sales tax are that for **tax rate of n%, shelf price of p** contains (**np/100** rounded up to **nearest 0.05**) amount of **sales tax**

Write **application in Python** that **prints out the receipt details for these shopping baskets.**

Sample Inputs & Outputs (Test Cases)

Case 1 :

Input 1:

1 book at 12.49

1 music CD at 14.99

1 chocolate bar at 0.85

Output 1:

1 book: 12.49

1 music CD: 16.49

1 chocolate bar: 0.85

Sales Taxes: 1.50 Total: 29.83

Case 2 :

Input 2:

1 imported box of chocolates at 10.00

1 imported bottle of perfume at 47.50

Output 2:

1 imported box of chocolates: 10.50

1 imported bottle of perfume: 54.65

Sales Taxes: 7.65 Total: 65.15

Case 3 :

Input 3:

1 imported bottle of perfume at 27.99 1 bottle of perfume at 18.99

1 packet of headache pills at 9.75

1 box of imported chocolates at 11.25

Output 3:

1 imported bottle of perfume: 32.19 1 bottle of perfume: 20.89

1 packet of headache pills: 9.75

1 imported box of chocolates: 11.85

Sales Taxes: 6.70 Total: 74.68

```
class Constant(object):
    PARSE_DESCRIPTION_PATTERN = "(\d+)\s((imported\s)?\w+(\s\w+)*)\sat\s(\d+\.\d+)"
    COUNT_INDEX = 1
    NAME_INDEX = 2
    PRICE_INDEX = 5
    BOOK = ["book"]
    FOOD = ["chocolate bar", "box of chocolates"]
    MEDICAL = ["packet of headache pills"]
    BASE_TAXES = 0.1
    IMPORTED_TAXES = 0.05
    TAX_RATE_MIN_RANGE = 0.05
    IMPORTED_TEXT_IDENTIFY = "imported"
    SALES_TAXES_TEXT_IDENTIFY = "Sales Taxes: "
    TOTAL_TEXT_IDENTIFY = "Total: "

class NoTax:

    def __init__(self):
        pass

    def tax_rate(self, name):
        return 0

class BaseTax(NoTax):
    def tax_rate(self, name):
        return Constant.BASE_TAXES

class ImportedTax(NoTax):
    def tax_rate(self, name):
        return Constant.IMPORTED_TAXES

class TaxFactory:
    @staticmethod
    def build(name):
        taxes = [NoTax()]
        if TaxFactory.__item_not_in_exemptions_list(name):
            taxes.append(BaseTax())
        if TaxFactory.__item_is_imported(name):
            taxes.append(ImportedTax())
        return taxes

    @staticmethod
    def __item_not_in_exemptions_list(name):
        item_name = name.replace("%s " % Constant.IMPORTED_TEXT_IDENTIFY, "")
        return item_name not in Constant.BOOK + Constant.FOOD + Constant.MEDICAL

    @staticmethod
    def __item_is_imported(name):
        return Constant.IMPORTED_TEXT_IDENTIFY in name

class TaxRate():
    def __init__(self):
        pass
```

```
    def tax_rate(self, name):
        taxes = TaxFactory.build(name)
        tax_rate = 0
        for tax in taxes:
            tax_rate += tax.tax_rate(name)
        return tax_rate

import re

class Item:
    def __init__(self, description):
        match = re.search(Constant.PARSE_DESCRIPTION_PATTERN, description)
        self.count = match.group(Constant.COUNT_INDEX)
        self.name = match.group(Constant.NAME_INDEX)
        self.source_price = float(match.group(Constant.PRICE_INDEX))

    def sale(self):
        return str("%s %s: %.2f" % (self.count, self.name, self.price()))

    def tax(self):
        price = round(self.source_price * TaxRate().tax_rate(self.name), 2)
        mod = price % Constant.TAX_RATE_MIN_RANGE
        return price if mod == 0 else price + (Constant.TAX_RATE_MIN_RANGE - mod)

    def price(self):
        return round(self.source_price + self.tax(), 2)

class Items:
    def __init__(self, items):
        self.items = items

    def tax(self):
        tax = 0
        for item in self.items:
            tax += item.tax()
        return str((Constant.SALES_TAXES_TEXT_IDENTIFY + "%.2f") % tax)

    def total(self):
        total = 0
        for item in self.items:
            total += item.price()
        return str((Constant.TOTAL_TEXT_IDENTIFY + "%.2f") % total)
```

```
class ItemTestCase():
   def __init__(self):
       print("-------------------------------------------------------")
       n=int(input(" Enter number of items in the order = "))
       print("-------------------------------------------------------")

       il=[]
       ol=[]

       ip=[]
       op=[]
```

```
        for i in range(n):
            item = Item(input("  Enter item : "))
            il.append(item)
            ip.append(item.price()-item.tax())
            result = item.sale()
            ol.append(result)
            op.append(item.price())
        print("                                                      ")
        print(" ------------------------------------------------- ")
        print("                  AISLE SUPER MARKET                  ")
        print(" ------------------------------------------------- ")
        print("  244, 6th Cross, IndiraNagar II Stage, Hoysala Nagar  ")
        print('       Indiranagar, Bengaluru, Karnataka 560038        ')
        print(" ------------------------------------------------- ")
        print("                     TAX - INVOICE                    ")
        print(" ------------------------------------------------- ")
        print("  GSTIN : 24AISLE1206D1ZM         FSSAI:1152209123343  ")
        print(" ------------------------------------------------- ")
        for k in ip:
            k=float(k)
        for m in op:
            m=float(m)
        #get date and time
        from datetime import datetime
        import pytz
        IST = pytz.timezone('Asia/Kolkata')
        datetime_ist = datetime.now(IST)
        print("         Date & Time : ",datetime_ist.strftime('%d-%m-%Y %H:%M:%S'),'
        print(" ------------------------------------------------- ")
        print("                    Items Description                 ")
        print(" ------------------------------------------------- ")
        for g in ol :
            print('  ',g)
        taxable_amount=round(sum(ip),2)

        total=round(sum(op),2)

        salestax=round(total-taxable_amount,2)
        print(" ------------------------------------------------- ")
        print("  Taxable Bill Amount :",taxable_amount)
        print(" ------------------------------------------------- ")
        print("  Sales tax Applicable: ",salestax)
        print(" ------------------------------------------------- ")
        print("  Total Payable Amount:",total)
        print(" ------------------------------------------------- ")
        print("                       CASH PAID                     ")
        print(" ------------------------------------------------- ")
        print("    This is Computer generated Bill,No sign required   ")
        print(" ------------------------------------------------- ")
        print("               Thank You, Visit Us Again              ")
        print(" ------------------------------------------------- ")
```

Test Cases : Inputs & Outputs

```
1 TestCase1 = ItemTestCase()
```

```
-------------------------------------------------------
 Enter number of items in the order = 3
-------------------------------------------------------
  Enter item : 1 book at 12.49
  Enter item : 1 music CD at 14.99
  Enter item : 1 chocolate bar at 0.85

 -------------------------------------------------------
                 AISLE SUPER MARKET
 -------------------------------------------------------
  244, 6th Cross, IndiraNagar II Stage, Hoysala Nagar
       Indiranagar, Bengaluru, Karnataka 560038
 -------------------------------------------------------
                    TAX - INVOICE
 -------------------------------------------------------
  GSTIN : 24AISLE1206D1ZM         FSSAI:1152209123343
 -------------------------------------------------------
         Date & Time :  17-06-2022 17:13:08
 -------------------------------------------------------
                   Items Description
 -------------------------------------------------------
   1 book: 12.49
   1 music CD: 16.49
   1 chocolate bar: 0.85
 -------------------------------------------------------
  Taxable Bill Amount : 28.33
 -------------------------------------------------------
  Sales tax Applicable:  1.5
 -------------------------------------------------------
  Total Payable Amount: 29.83
 -------------------------------------------------------
                      CASH PAID
 -------------------------------------------------------
    This is Computer generated Bill,No sign required
 -------------------------------------------------------
               Thank You, Visit Us Again
 -------------------------------------------------------
```

```
1 TestCase2 = ItemTestCase()
```

```
-------------------------------------------------------
 Enter number of items in the order = 2
-------------------------------------------------------
  Enter item : 1 imported box of chocolates at 10.00
  Enter item : 1 imported bottle of perfume at 47.50

 -------------------------------------------------------
                 AISLE SUPER MARKET
 -------------------------------------------------------
  244, 6th Cross, IndiraNagar II Stage, Hoysala Nagar
       Indiranagar, Bengaluru, Karnataka 560038
 -------------------------------------------------------
                    TAX - INVOICE
 -------------------------------------------------------
  GSTIN : 24AISLE1206D1ZM         FSSAI:1152209123343
 -------------------------------------------------------
```

```
        Date & Time :  17-06-2022 17:14:52
-----------------------------------------------------
                  Items Description
-----------------------------------------------------
  1 imported box of chocolates: 10.50
  1 imported bottle of perfume: 54.65
-----------------------------------------------------
 Taxable Bill Amount : 57.5
-----------------------------------------------------
 Sales tax Applicable:  7.65
-----------------------------------------------------
 Total Payable Amount: 65.15
-----------------------------------------------------
                     CASH PAID
-----------------------------------------------------
   This is Computer generated Bill,No sign required
-----------------------------------------------------
              Thank You, Visit Us Again
-----------------------------------------------------
```

```
1 TestCase3 = ItemTestCase()
```

```
-------------------------------------------------------
 Enter number of items in the order = 4
-------------------------------------------------------
  Enter item : 1 imported bottle of perfume at 27.99
  Enter item : 1 bottle of perfume at 18.99
  Enter item : 1 packet of headache pills at 9.75
  Enter item : 1 box of imported chocolates at 11.25

 -----------------------------------------------------
                 AISLE SUPER MARKET
 -----------------------------------------------------
  244, 6th Cross, IndiraNagar II Stage, Hoysala Nagar
       Indiranagar, Bengaluru, Karnataka 560038
 -----------------------------------------------------
                   TAX - INVOICE
 -----------------------------------------------------
 GSTIN : 24AISLE1206D1ZM         FSSAI:1152209123343
 -----------------------------------------------------
        Date & Time :  17-06-2022 17:16:27
 -----------------------------------------------------
                  Items Description
 -----------------------------------------------------
  1 imported bottle of perfume: 32.19
  1 bottle of perfume: 20.89
  1 packet of headache pills: 9.75
  1 box of imported chocolates: 11.85
 -----------------------------------------------------
 Taxable Bill Amount : 67.98
 -----------------------------------------------------
 Sales tax Applicable:  6.7
 -----------------------------------------------------
 Total Payable Amount: 74.68
 -----------------------------------------------------
                     CASH PAID
 -----------------------------------------------------
   This is Computer generated Bill,No sign required
 -----------------------------------------------------
```

```
                    Thank You, Visit Us Again
-------------------------------------------------------
```

Problem 2: Given below are 2 tables, conversations and messages.

conversations		
PK	**id**	**(id of each conversation)**
datetime	**created at**	(conversation created time)

messages		
PK	**id**	(id of message)
FK	**conversation_id**	**(id of each conversation)**
FK	**user_id**	(ID of the user who sent the message)
text	**content**	(Message/text written by the user)
datetime	**sent_time**	(Time of message when it was sent)

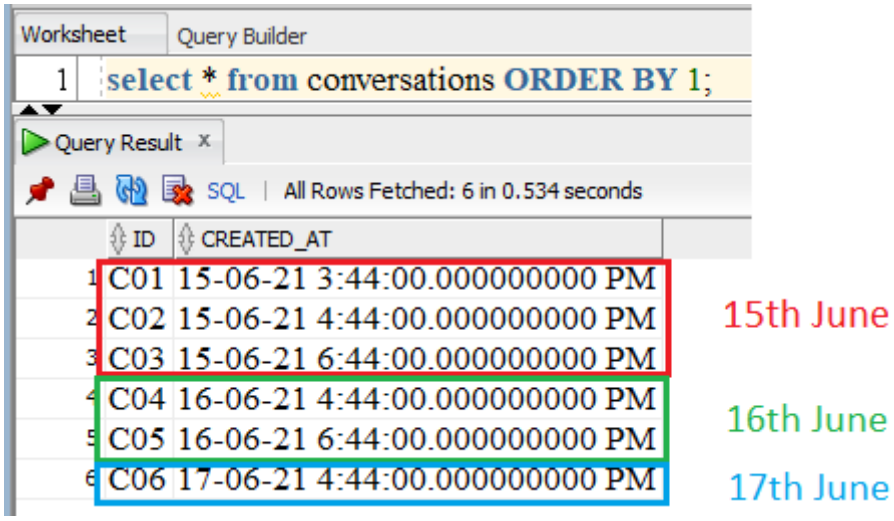
Assume only 2 users are a part of 1 conversation.

Write a SQL query to:

- Fetch **number of first message sent in a conversation in a day. Date range** - 1st Jan 2021 to 31st Dec 2021.
- Fetch **number of first reply message sent in a conversation in a day. Date range** - 1st Jan 2021 to 31st Dec 2021.
- **Total conversation with 3 way messaging.** 3 way messaging **means User1 sent the message, then User2 replied and finally User1 messaged back.**

I have Created a sample table as follows to work on the query requirements , it is as follows

Conversations Table



Messages Table

```
29  SELECT * FROM MESSAGES;
30
```

Query Result | SQL | All Rows Fetched: 14 in 0.483 seconds

	ID	CONVERSATION_ID	USER_ID	CONTENT	SENT_TIME	
1	M01	C01	U1	Hi	15-06-21 3:44:00.000000000 PM	first message sent
2	M02	C01	U2	Hello	15-06-21 3:45:00.000000000 PM	first reply message
3	M03	C01	U1	How are you ?	15-06-21 3:46:00.000000000 PM	3 way messaging
4	M04	C02	U1	Hi	15-06-21 4:44:00.000000000 PM	first message sent
5	M05	C02	U3	Hello	15-06-21 4:45:00.000000000 PM	first reply message
6	M06	C02	U1	How are you ?	15-06-21 4:46:00.000000000 PM	3 way messaging
7	M07	C03	U1	Hi	15-06-21 6:44:00.000000000 PM	first message sent
8	M08	C03	U4	Hello	15-06-21 6:47:00.000000000 PM	first reply message
9	M09	C03	U1	How are you ?	15-06-21 6:49:00.000000000 PM	3 way messaging
10	M10	C04	U1	Hi	16-06-21 4:44:00.000000000 PM	first message sent
11	M11	C04	U2	Hello	16-06-21 4:45:00.000000000 PM	first reply message
12	M12	C05	U1	Hi	16-06-21 6:44:00.000000000 PM	first message sent
13	M13	C05	U3	Hello	16-06-21 6:45:00.000000000 PM	first reply message
14	M14	C06	U1	Hi	17-06-21 4:44:00.000000000 PM	first message sent

15th June

16th June

17th June

1) Fetch **number of first message sent in a conversation in a day. Date range** - 1st Jan 2021 to 31st Dec 2021.

Query :

SELECT date_, SUM(count_) FROM

```
(
    SELECT
        to_date(to_char(c.created_at, 'DD-MM-YYYY')) AS date_,
        COUNT(DISTINCT m.conversation_id)                AS cc
    FROM conversations c, messages m
    WHERE c.id = m.conversation_id
        AND to_date(to_char(c.created_at, 'DD-MM-YYYY')) BETWE
    GROUP BY to_date(to_char(c.created_at, 'DD-MM-YYYY')), m.c
    HAVING COUNT(m.id) >= 1
)
```

GROUP BY date_

Output

```
117 SELECT
118     date_, SUM(count_)
119 FROM
120                         (
121                           SELECT
122                             to_date(to_char(c.created_at, 'DD-MM-YYYY')) AS date_,
123                             COUNT(DISTINCT m.conversation_id)            AS count_
124                           FROM conversations c, messages m
125                           WHERE c.id = m.conversation_id
126                             AND to_date(to_char(c.created_at, 'DD-MM-YYYY')) BETWEEN '01-01-21' AND '31-12-21'
127                           GROUP BY to_date(to_char(c.created_at, 'DD-MM-YYYY')), m.conversation_id
128                           HAVING COUNT(m.id) >= 1
129                         )
130 GROUP BY date_
```

Query Result

SQL | All Rows Fetched: 3 in 1.601 seconds

	DATE_	SUM(COUNT_)
1	15-06-21	3
2	16-06-21	2
3	17-06-21	1

Here Output of inner query will be like this ,

	DATE_	COUNT_
1	15-06-21	1
2	15-06-21	1
3	15-06-21	1
4	16-06-21	1
5	16-06-21	1
6	17-06-21	1

this will be considered as table

and then a group by & count function will be applied over top of it on Outer side to get final output as below

	DATE_	SUM(COUNT_)
1	15-06-21	3
2	16-06-21	2
3	17-06-21	1

2) Fetch **number of first reply message sent in a conversation in a day. Date range** - 1st Jan 2021 to 31st Dec 2021.

for this question COUNT(m.id) >= 2 in queary instead of 1

SELECT date_, SUM(count_) FROM

```
                    (
                        SELECT
                            to_date(to_char(c.created_at, 'DD-MM-YYYY')) AS date_,
                            COUNT(DISTINCT m.conversation_id)                AS co
                        FROM conversations c, messages m
                        WHERE c.id = m.conversation_id
                            AND to_date(to_char(c.created_at, 'DD-MM-YYYY')) BETWE
                        GROUP BY to_date(to_char(c.created_at, 'DD-MM-YYYY')), m.c
                        HAVING COUNT(m.id) >= 2
                    )
```

GROUP BY date_

```
SELECT
   date_, SUM(count_)
FROM
                    (
                      SELECT
                        to_date(to_char(c.created_at, 'DD-MM-YYYY')) AS date_,
                        COUNT(DISTINCT m.conversation_id)            AS count_
                      FROM conversations c, messages m
                      WHERE c.id = m.conversation_id
                        AND to_date(to_char(c.created_at, 'DD-MM-YYYY')) BETWEEN '01-01-21' AND '31-12-21'
                      GROUP BY to_date(to_char(c.created_at, 'DD-MM-YYYY')), m.conversation_id
                      HAVING COUNT(m.id) >= 2
                    )
GROUP BY date_
```

Query Result

SQL | All Rows Fetched: 2 in 0.123 seconds

	DATE_	SUM(COUNT_)
1	15-06-21	3
2	16-06-21	2

3) **Total conversation with 3 way messaging.** 3 way messaging **means User1 sent the message, then User2 replied and finally User1 messaged back.**

for this question COUNT(m.id) >= 3 in queary instead of 2

SELECT date_, SUM(count_) FROM

```
                    (
                        SELECT
                            to_date(to_char(c.created_at, 'DD-MM-YYYY')) AS date_,
                            COUNT(DISTINCT m.conversation_id)                AS co
                        FROM conversations c, messages m
                        WHERE c.id = m.conversation_id
                            AND to_date(to_char(c.created_at, 'DD-MM-YYYY')) BETWE
```

```
                                    GROUP BY to_date(to_char(c.created_at, 'DD-MM-YYYY')), m.c
                                    HAVING COUNT(m.id) >= 3
                                )
```

GROUP BY date_

```
117 SELECT
118    date_, SUM(count_)
119 FROM
120                        (
121                           SELECT
122                              to_date(to_char(c.created_at, 'DD-MM-YYYY')) AS date_,
123                              COUNT(DISTINCT m.conversation_id)            AS count_
124                           FROM conversations c, messages m
125                           WHERE c.id = m.conversation_id
126                              AND to_date(to_char(c.created_at, 'DD-MM-YYYY')) BETWEEN '01-01-21' AND '31-12-21'
127                           GROUP BY to_date(to_char(c.created_at, 'DD-MM-YYYY')), m.conversation_id
128                           HAVING COUNT(m.id) >= 3
129                        )
130 GROUP BY date_
```

Query Result

SQL | All Rows Fetched: 1 in 0.061 seconds

	DATE_	SUM(COUNT_)
1	15-06-21	3

Thank You

Crafted with ♥ for Aisle