ICS 104.59 - Introduction to Programming

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Lab Project (v2.1)

In this project, you will write a Python program that generates a bill for some store. The store owner provides two text files as an input. The program first reads the input file named "items.txt" which contains a list of all items in the store with their unit-prices. The program stores the items in in one list called itemList according to their order given in the items.txt file. The index of each item in this list is used as a serial number (S/N) of the item. Then the program reads the other input file named "promo.txt" which contains the information about special discounts for promo items. When a customer places an order, a text file is created where each lines has the item S/N and the quantity. For simplicity, assume all quantities are integers. The program then generates a bill for the customer using the information stored in the itemList.

Input File Format:

1. Input file (items.txt): each line in this file contains the item name followed by its price.
2. Input file (promo.txt): a list of item S/N for all items on promo.
3. Order file: each line in this file contains the item S/N followed by the quantity.
   Samples of these input files are given below. (See File Samples).

Main Requirements:

1. [10 pts] When it is started, the program reads the items.txt file, and stores the data in one list named itemList. Each entry in this list has three parts: itemName, itemPrice, and itemType. Both the name and the price are given in the items.txt file. The itemType is either S for standard items (by default) or P for promo items (updated next in Step 2).
2. [5 pts] The program then reads the promo.txt files, and for each item S/N in the file, it updates the type of that item in the list to (P).
3. [5 pts] The program then prompts the user to enter the order file name.
   - `Please enter the order file name (or Q to quit): _`
   - When the user types the order file name, the program processes the order to generate the bill.
   - The program will keep prompting for new orders and generating bills until the user hit Q to quit.
4. [20 pts] The program should compute the amount of each item in the order according to its unit price and quantity. Then it adds up all the amounts and finds the total sales amount. It applies the discount if any, adds 15% VAT, and computes the grand total.
5. [10 pts] There are two kinds of discount in this store.
   - For Promo items, apply BOGO (buy-one-get-one free).
   - If the total amount (excluding VAT and promo items) is more than SAR 1000, the store will give one of the standard purchased items for free. So, the program should deduct the price of one unit of the most expensive standard item included in the order (exclude promo items).
   - All discounted amounts are added up, and only the total of the discount will be shown in the bill and deducted from the grand total before applying the VAT.

6. [10 pts] The program then creates the bill and saves it in output file. The output file name is bill_xxxx where xxxx is the name of order file. An example of the bill output file is given in File Samples below.

Technical Requirements:

1. [10 pts] You should use functions to perform common tasks. For example, to read and process a line from an input file, to write a line to an output file, to perform common computations, … etc.
2. [10 pts] The program should be well-documented.
3. [20 pts] The output format should be similar to the ones given in the sample files.

What to submit?

1. Create one more order text file similar to sultan.txt, and save it in your name.
2. Test your code using the provided input files and the one you created, and confirm the output. Take screenshots of the output files, the input files you made, and your code, put them all in one pdf document.
3. Submit one zipped file containing the following:
   - your code (in ipynb file),
   - your input files (do not include output files),
   - and the pdf document prepared in step 2.

Sample Files: (you can copy/paste and save below data as text file for input)

1. items.txt

```
Apples      10.50
Bananas     12.25
Cherries    25.00
Donuts      10.00
Eggs        2.50
Flowers     15.00
Grapes      20.00
Honey       150.00
Icecream    50.00
JavaCoffee  250.00
Zafron      350.00
```

2. promo.txt (Donuts and Flowers are on promo this month)

```
4
6
```

3. sultan.txt (input file for Sultan's order)

```
1     2
3     2
4     5
6     3
8     2
9     1
5     30
10    3
11    2
1     1
6     1
```

4. bill_sultan.txt (output file for Sultan's bill)

```
=========================================
SN   ITEM           QTY  U.PRICE    AMOUNT
-----------------------------------------
1    Apples           3    10.50     31.50
3    Cherries         2    25.00     50.00
4    Donuts           5    10.00     50.00
5    Eggs            30     2.50     75.00
6    Flowers          4    15.00     60.00
8    Honey            2   150.00    300.00
9    Icecream         1    50.00     50.00
10   JavaCoffee       3   250.00    750.00
11   Zafron           2   350.00    700.00
-----------------------------------------
                  Sales Amount.. 2066.50
                  Discount......  400.00
                  Total Amount.. 1666.50
                  VAT 15%.......  259.98
                  Grand Total... 1916.48
=========================================
```

5. ahmad.txt (input file for Ahmad's order)

```
10   1
6    1
10   3
```

6. bill_ahmad.txt (output file for Ahmad's bill)

```
=========================================
SN   ITEM           QTY  U.PRICE    AMOUNT
-----------------------------------------
6    Flowers          1    15.00     15.00
10   JavaCoffee       4   250.00   1000.00
-----------------------------------------
                    Sales Amount.. 1015.00
                    Discount......    0.00
                    Total Amount.. 1015.75
                    VAT 15%.......  152.25
                    Grand Total... 1167.25
=========================================
```

7. badr.txt (input file for Badr's order)

```
1    90
5    10
1    10
6    1
```

8. bill_badr.txt (output file for Ahmad's bill)

```
=========================================
SN   ITEM           QTY  U.PRICE    AMOUNT
-----------------------------------------
1    Apples         100    10.50   1050.00
5    Eggs            10     2.50     25.00
6    Flowers          1    15.00     15.00
-----------------------------------------
                    Sales Amount.. 1090.00
                    Discount......   10.50
                    Total Amount.. 1079.50
                    VAT 15%.......  161.92
                    Grand Total... 1241.42
=========================================
```

9. charlie.tx (input file for Charlie's order)

```
11    3
```

10. bill_charlie.txt (output file for Charlie's bill)

```
==========================================
SN   ITEM           QTY  U.PRICE    AMOUNT
------------------------------------------
11   Zafron           3   350.00   1050.00
------------------------------------------
                   Sales Amount.. 1050.00
                   Discount......  350.00
                   Total Amount..  700.00
                   VAT 15%.......  105.00
                   Grand Total...  805.00
==========================================
```