

Individual Project

Assuming you are the member of the IT department in **AI_Tone mall** to develop a program to assist the auditing process for the sales and invoice system procedure. Your program is to create an audit file to check the correctness of the transaction together with the integrity of the data stored in the system.

You are going to write a demo program to your section head to illustrate the followings

- 1) The correctness of the order number displaced in the invoice record
- 2) Check the correctness of the amount calculated in the invoice :
 - A) The amount the mall dollars calculated
 - B) The amount of the total payment
 - C) The correctness of the discount given
- 3) Create the Hash total for the particular invoice for further processing

Reference : The Problem to Solve & Sample Invoice

訂購編號 Order No.
A123456B5678784(7)

- First alphabet : range from A to Z, then back to (A)
- Next 6 digits : staff number - in charge of this online order (123456)
- Next alphabet : indicate the Modulus used in calculating the check digit (B)
A – Modulus 9; B – Modulus 8
- Next 6 digits : order number (567878)
- Next digit : Number of items in this order (maximum 9), if more than 9 , the system will switch to a new order (4 items in this one)
- Next digit in () : Check digit of the order number (7)

1. Calculation of Check Digit for the order number

A) Using the staff number as the multiplier

B) Using the alphabet after the staff number to determine the Modulus used

From the above, staff number is 123456 and using Modulus 8 to create check digit

1	2	3	4	5	6
*	*	*	*	*	*
5	6	7	8	7	8

$$= \{5 + 12 + 21 + 32 + 35 + 48 + (\text{Check Digit})\} \text{ divisible by } 8$$

$$= \{153 + (\text{Check Digit})\} \text{ divisible by } 8$$

So the check digit is 7

2. Cost Verification procedure

數量 Qty	總數 Total	Sum of items total = Sub-total
		There are 2 possible discount applied to the order
		VIP discount : ranging from 2 dollars to 20 dollars
4	\$ 108.00	VIPXX discount : $90 \leq XX \leq 98$
1	\$ 198.00	e.g. 95 means 5% discount to the total after deducting the VIP discount
3	\$ 158.70	Delivery Fee depends on the Sub-total
1	\$ 280.00	Total = Sub-total – 2 discounts + delivery fee
總價 SubTotal	\$ 744.70	<u>Rounding method</u> is used in calculation
VIP	-\$ 2.00	Delivery Fee = 0 if Sub-total ≥ 500
VIPDAY95	-\$ 37.14	= 50; otherwise
運費 Delivery Fee	FREE	
付款總額 Total	\$ 705.56	

3. Hash Total for this order Calculation

1121.	Hash Total for this order
2134.	= sum of the last 2 digits item number
3019.	= 21 + 34 + 19 + 18
4018.	= 92

4. Mall dollars calculation

Total > = 1000, Mall dollars = Total * 0.002

Input for the Program

The data from the physical invoice, a list of data will be provided for testing in next week, use the current one (in page 6) to start your work

Process

Determine the format of the invoice number is correct

Determine the check digit for the order is correct

Calculate the Hash Total for individual order for inventory warehouse checking

Calculate the mall dollars

Check the sub-total, delivery fee and total are correct

Output in clear format

- The result of the invoice number format checking
- The correctness of the check digit
- The correctness of the Total/sub-total/VIP discount/VIPXX discount/Delivery fee/Mall dollars
- The Hash total for the order for further processing

Marking Scheme for Programs (15 marks)

13 marks: Program achieved the requirements

2 marks: Comments within the Program

Bonus (3 marks maximum)

Innovative idea to improve the flexibility of the program

Due Date

Section 1 Due Date : 18/03/2024 Monday before 2:30p.m. through moodle

Section 2 Due Date : 22/03/2024 Friday before 8:30a.m. through moodle

General requirements for Program


- 1) Provide name and student number in the beginning of the program
- 2) Write comments to explain your programming logic
- 3) At least write **2 functions** in your program
- 4) Good use of data structure available in Python
- 5) To solve the problem

Submission

Program : indXXXXXXXX.ipynb XXXXXXXX is your student number

In Jupyter Notebook format so that I can read the **results** when you run your program

Sample Invoice from AI Tone mall

		AI_Tone	mall	
賬單 INVOICE				
訂單日期 Invoice Date 2022-02-10	訂購編號 Order No. A123456B5678784(7)		此單賺取 Mall Dollar \$0.0	
商品詳情 Description			數量 Qty	總數 Total
Customer Number : 987654				
1121.	AI_Tone Shampoo	4	\$ 108.00	
2134.	BTM Baby Powder	1	\$ 198.00	
3019.	Covid – 19 Test kit	3	\$ 158.70	
4018.	KF-95 Anti-Covid Mask	1	\$ 280.00	
送貨詳情 Shipping To		總價 SubTotal \$ 744.70		
Customer Name : ABC TONE Customer Address : ZZZZZZZ		VIP -\$ 2.00		
		VIPDAY95 -\$ 37.14		
		 運費 Delivery Fee FREE		
		付款總額 Total \$ 705.56		