

S&T-1st C Programming Lab 5

Text File and Essential Features

19 Feb 2025, Wednesday, 6:45pm

Please unzip **Lab5.zip** sent to you by email attachment in your NUS Email.

Question 1:

Mr Lee sells three types of old-fashioned diskette: Type A (3.6K capacity), Type B (1.4M capacity) and Type C (1.2M capacity). The unit prices are **\$4 for Type A**, **\$6 for Type B**, and **\$5 for Type C**. His billing information is stored in a file named **bill.inf**, where each row contains the bill number and the quantity purchased for each type of diskette.

Bill Number	Quantity Purchased for Type A Diskette	Quantity Purchased for Type B Diskette	Quantity Purchased for Type C Diskette
1000	50	60	70
1200	120	100	80
2410	50	300	400
7300	120	100	153
7623	100	50	40
3847	90	90	150
4552	10	300	140
7893	10	20	30

bill.inf

Mr Lee gives discounts to his customers only if they purchase bulk quantities. The discount applies to any type of diskette. The discount rate for each type of diskette is given in the following table:

	Type A Diskette	Type B Diskette	Type C Diskette
Quantity	> 100	> 200	> 150
Discount Rate	2 %	5 %	10 %

For example, the payment for Bill No. : 7300 is

$$120 \times 4 \times (1-0.02) + 100 \times 6 + 153 \times 5 \times (1-0.1) = \$1758.90$$

Write a program named as **discount.c** to compute the payment for each bill and the total payment for the input file as follows:

Bill Number	Payment (\$)
1000	910.00
1200	1470.40
2410	3710.00
7300	1758.90
:	:
:	:
Total payment: \$13159.30	

bill.ouf

Print the output in a file named as bill.ouf.

Question 2:

On the display board of a money changer in Clementi Shopping Centre, the following exchange rates were shown yesterday:

Currency	Buy	Sell
Chinese Renminbi	201	490

The interpretations of the data are as follows:

- For each 1000 Chinese Yuan Renminbi (RMB) the money changer bought from you yesterday, the money changer would pay you 201 Singapore Dollar (SGD). As such, if you gave x (RMB) to the money changer yesterday, you would get $x \times \frac{201}{1000}$ (SGD).
- For each 100 Singapore Dollar (SGD) you sold to the money changer yesterday, the money changer would pay you 490 Chinese Yuan Renminbi (RMB). As such, if you gave y (SGD) to the money changer yesterday, you would get $y \times \frac{490}{100}$ (RMB).

Due to the market fluctuation, the two exchange rates are updated regularly. The latest values are kept in the text file named as **rate.dat** (unzip from

lab5.zip). The latest contents are stored in this format:

$d_1d_2d_3$
$d_4d_5d_6$

where

$d_1d_2d_3$ is the buy rate, and $d_4d_5d_6$ is the sell rate.

The C program used to compute the currency exchanges is named as **currency.c**. The latest session of program execution as seen on screen is as follows:

Currency Conversion

1. Customer sells Renminbi
2. Customer buys Renminbi
3. Quit

Enter your choice: **1**

How much Renminbi are you selling? **1000**

For 1000.00 CNY (Chinese Yuan Renminbi) you will get 198.00 SGD (Singapore Dollar).

Currency Conversion

1. Customer sells Renminbi
2. Customer buys Renminbi
3. Quit

Enter your choice: **2**

How much Singapore Dollar do you have? **100**

For 100.00 SGD (Singapore Dollar) you will get 485.00 CNY (Chinese Yuan Renminbi).

Currency Conversion

1. Customer sells Renminbi
2. Customer buys Renminbi
3. Quit

Enter your choice: **1**

How much Renminbi are you selling? **485**

For 485.00 CNY (Chinese Yuan Renminbi) you will get 96.03 SGD (Singapore Dollar).

Currency Conversion

1. Customer sells Renminbi
2. Customer buys Renminbi
3. Quit

Enter your choice: **6**

Invalid command--please try again

Currency Conversion

1. Customer sells Renminbi
2. Customer buys Renminbi
3. Quit

Enter your choice: **3**

Have a nice day!

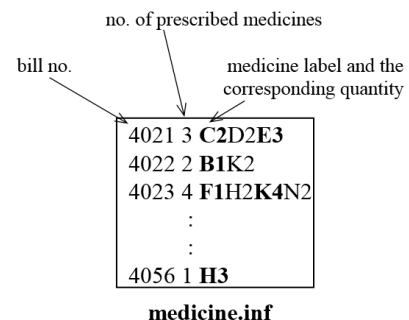
You can proceed as follows in **currency.c**:

- (i) Include the C instructions to open the text file to read the two exchange rates.
- (ii) Include the C instructions to provide the interactive iteration to allow the user to convert the currency from Chinese Yuan Renminbi to Singapore Dollar and vice versa until the **Quit** option is preferred.

Question 3:

The prescription data of each medical consultation is stored in a text file named as **medicine.inf** (unzip from lab5.zip) as follows:

Each row in the input file contains the bill number, number of medicines prescribed, and the label and the corresponding quantity for each prescribed medicine. For each bill the number of prescribed medicines may



not be the same. The unit price for each type of medicine is given in the following table:

<i>Label</i>	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
<i>Unit Price (\$)</i>	9	9	9	15	15	15	15	5	5	5	5	12	12	12	12

For example, the payment for bill no. 4021 is \$ $(9 \times 2 + 15 \times 2 + 15 \times 3) = \93 .

Organize your program named as **bill.c** as follows:

- (i) Write a C function that contains a character as the argument for medicine label, and returns the corresponding unit price to its caller based on the above table. The header of function is as follows:

int price (char label)

- (ii) Write the main function to process **medicine.inf**, and produce the billing report in a text file named as **charges.ouf**. The main function should make use of the function in part (i), and the report should be formatted as shown.

Bill No.	Prescription Charge (\$)
4021	93.00
4022	19.00
4023	69.00
:	:
:	:
4056	15.00

charges.ouf

Question 4:

Write a C program named as **encode.c** that accepts a message from keyboard, and displays on the screen its encrypted message by substitution method. For example:

Enter message: **Be gracious and graceful.**
 Encrypted message: B\$ gr!c#*&s !nd gr!c\$f&l.

Only the vowels in small letters are substituted based on the following table:

Vowel	a	e	i	o	u
Substitution	!	\$	#	*	&

The lab time is only two hours. Please prepare for your programs in advance. - A/Prof Tay