計算機概論與程式設計

Lab 1

Fundamentals & Formatted Input/Output

Week 2 (2022/09/19)

Lab: EC447

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注意事項

1. 一定要來上課，課堂中Demo
2. 沒有回家作業，課堂中未Demo以0分計算
3. 若因課堂時間因故無法到場，請於課前寄email向助教請假
4. Lab寫完找助教Demo完畢上傳至E3 以 **LAB<x>_學號.c** 作為檔名
5. Demo完可以提早離開
6. 寫lab時遇到問題可以舉手
7. 請勿在電腦教室飲食

Lab 1

The design allows the user to enter **loan amount**, **annual interest rate** and **the number of loan periods.**

And **classify the currency value** according to the input amount. Such as, $2000, $1000, $500, $100, $10, $1.

Finally, output **Monthly interest rate** and the **total loan amount (including interest).**

➢ **Notice:**

Need to input and output according to the specified format.

Sample Input

1. The loan amount needs to be entered
   - must contain six digits
   - start with a dollar sign($) followed by a space
   - use comma(,) to separate every three digits
   - for example, $ xxx,xxx

2. Enter annual interest rate(年利率)

   - use float

3. Enter the number of loan periods
   - monthly(一月為一期)
   - use positive integer

➢ **Example input：**

```
Enter amount of loan: $ 101,677
Enter annual rate of interest(%): 24.0
Enter the number of loan periods(monthly): 3
```

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Sample Output

1. Make a table with formatted output
   - The table header is as follows(請使用下方作為表格標頭)
     - |$2000|$1000|$500|$100|$10|$1|
   - The table content is the amount of each currency value
   - Need to align table header

$$monthly\_interest\_rate$$
$$=(\frac{annual\_interest\_rate}{persent})/months\_per\_year$$
$$=(\frac{annual\_interest\_rate}{100})/12$$

2. Output monthly interest rate(月利率)
   - use float
   - accurate to 2 decimal places
   - requires a percent sign

➤ Example output：


```
| $2000| $1000| $500| $100| $10| $1|
|    50|     1|    1|    1|   7|   7|
Monthly interest rate: 2.00%
Total loan amount: $107777.6
```

3. Output the total lond amount (including interest)
   - use float
   - accurate to 1 decimal places

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Require

- When calculating the monthly interest rate, use **macro** to define the constant

    - $PERSENT$

    - $MONTHS\_PER\_YEAR$

$monthly\_interest\_rate$

$=(\dfrac{annual\_interest\_rate}{PERSENT})/MONTHS\_PER\_YEAR$

$=(\dfrac{annual\_interest\_rate}{100})/12$

Sample Input/Output

Input

Output

```
Enter amount of loan: $ 101,677
Enter annual rate of interest(%): 24.0
Enter the number of loan periods(monthly): 3
```

```
| $2000| $1000| $500| $100| $10| $1|
|    50|     1|    1|    1|   7|  7|
Monthly interest rate: 2.00%
Total loan amount: $107777.6
```

Test Case

- **Input 1**
  - $ 101,677
  - 24.0
  - 3

- **Output 1**

```
| $2000| $1000| $500| $100| $10| $1|
|   50|     1|    1|    1|   7|  7|
Monthly interest rate: 2.00%
Total loan amount: $107777.6
```

- **Input 2**
  - $ 452,983
  - 18.56
  - 7

- **Output 2**

```
| $2000| $1000| $500| $100| $10| $1|
|  226|     0|    1|    4|   8|  3|
Monthly interest rate: 1.55%
Total loan amount: $502026.0
```

- **Input 3**
  - $ 033,456
  - 35.2
  - 2

- **Output 3**

```
| $2000| $1000| $500| $100| $10| $1|
|   16|    50|    1|    0|   4|  5|  6|
Monthly interest rate: 2.93%
Total loan amount: $35418.8
```

Score

- Program requirements
  1. **Only one program can be submitted**
  2. Use **macro definition**   **(20%)**

- Output：
  1. A test case result is correct   **(25%*3)**
  2. Three test case result are correct,
     get 5 extra points   **(5%)**

得分條件

- 程式要求
  1. **只能繳交一支程式**
  2. 使用到**macro definition** (20%)

- 輸出：
  1. 一項測資結果正確 (25%*3)
  2. 三題全對額外加5分 (5%)