Program 03

You want to purchase an iPhone that costs xxxxx New Taiwan Dollars on the following credit plan: no down payment, an interest rate of yyyyy% per year (and hence yyyyy/12% per month), and monthly payments of zzzzz New Taiwan Dollars. Notice that the monthly payment of zzzzz is used to pay the interest and whatever is left is used to pay part of the remaining debt.

想分期買價格 xxxxx 的 iPhone, 無預付款, 年利率 yyyyy, 月利率你要換算, 月付款 zzzzz – 付利息如果有剩下全都用來還尚欠的貸款

Write a program that cins xxxxx (an int), yyyyy (a double), zzzzz (an int),
and couts

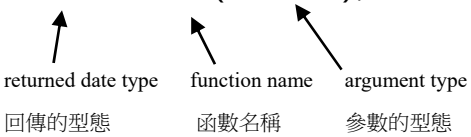
how many months it will take you to pay off the loan,
the monthly amount of interest paid and remaining debt for month 1,
the monthly amount of interest paid and remaining debt for month 2,
… and so on,
as well as the total amount of interest paid over the life of the load.

用 cin 輸入 xxxxx (an int), yyyyy (a double), zzzzz (an int)
用 cout 輸出

總共要還幾個月,
第 1 個月付了多少利息, 還了多少本金,
第 2 個月付了多少利息, 還了多少本金,
… 類推,
整個期間一共還了多少利息.

Background 背景知識

```
#include <cmath>
double floor(double);
```



Why the returned data type is double instead of int?
為什麼 回傳的型態是 實數 而非 數學上習慣用的 整數?

Because we need to round the numbers and there might have the following scenarios.
Suppose that we have

```
double x, y;
cin >> x;
```

Scenario 1: Want to round x to the nearest integer and assigns the result to y
y = floor(x + 0.5);
Scenario 2: Want to round x to 小數點以下第一位 and assigns the result to y
y = floor(x * 10 + 0.5) / 10;
Scenario 3: Want to round x to 小數點以下第二位 and assigns the result to y
y = floor(x * 100 + 0.5) / 100;

For this homework, we assume scenario 1, i.e., you should round the interest to the nearest int.

Sample Input
30000 15 2000
N

Sample Output
(I omit this part)

Sample Input
30000 15 2000
Y
30000 15 3000
Y
30000 15 4000
Y
30000 15 5000
N

Sample Output
(I omit this part)

Deadline: 10/17 13:20
You have to:
(1) demo your program to TA, and
(2) upload your CPP program to New e3 **請不要上傳可執行檔或壓縮檔**

10/17 demo 時，你必須有東西給助教看!!!!!!!!!

Upload your program to New e3 before you demo to TA.

考量有些同學需要較長的時間進入狀況
本次作業最終期限延長至 10/20 (Sun) 01:59:59

Note 1: **The name of your program must be in the following format:** p03_學號.cpp

Note 2: **Your program must begin with the following six comments.**

【程式最前面必須有下面 6 行註解，一行都不能少】【**紅字的地方記得要改**】

【CPP 程式最前面 6 行註解之後，必須加上一個 **至多 4 行的報告**. 內容要有:】

(i) the difficulty you encountered when writing this program

寫這個程式時遇到什麼困難,

(ii) anything special in your program **你的程式有什麼比較特別的地方**.

```
//File Name: xxxxxxxxxx.cpp
//Author: Your Name
//Email Address: your@yourmachine.bla.bla
//Assignment Number: 03
//Description: xxxxxxxxxx.
//Last Changed: xxxxxxxxxx, 2019
//(i) difficulty encountered?
//None.
//(ii) anything special?
//I provide two additional functions: (1) … (2) ….
```

如果你　很順利完成了程式，　　你可以寫: 還能添加什麼額外功能

如果你　有遇到困難但最終完成了程式，你可以寫: 你是怎麼解決的

如果你　遇到困難而且沒完成程式，　你可以寫: 發生什麼困難或那裡不懂

如果你曾參考別人的程式，**請一定要用 comments 寫出被參考者的學號**,

否則會被誤解為抄襲.　如果你在參考後，有做任何改進，請寫在 (ii) 中.

Grading policy:【評分原則】

- ☐ Accomplish Note 1: 5 points.
- ☐ Accomplish Note 2: 5 points.
- ☐ Use cin for input and cout for output: 5 points.
- ☐ Replace xxxxx, yyyyy and zzzzz by meaningful camelcase names: 5 points.
- ☐ Tell the user the purpose of this program: 5 points.
  【程式有 "在螢幕上" 告訴使用者，本程式的目的】
- ☐ Remind the user what kind of data should be inputted: 5 points.
  【程式有提醒使用者，要輸入什麼樣的資料】

☐ Output correct answers: 50 points.

公平起見，凡是不是使用老師講過的庫存函數 自己一步一腳印完成作業，
而是呼叫某些庫存函數來完成作業者，正確性這部份的分數 除以 2

☐ Allow the calculation to be repeated until the user wants to end the program: 5 points.
【使用者想執行幾次都可以】

☐ Make your program readable: 5 points.
【該凹就凹，該凸就凸，該空行就空行】

☐ Provide additional functions: 10 points.
【其他讓使用者更方便的手段或功能】

Total 100 points.

請助教選出 5 個左右的優良程式