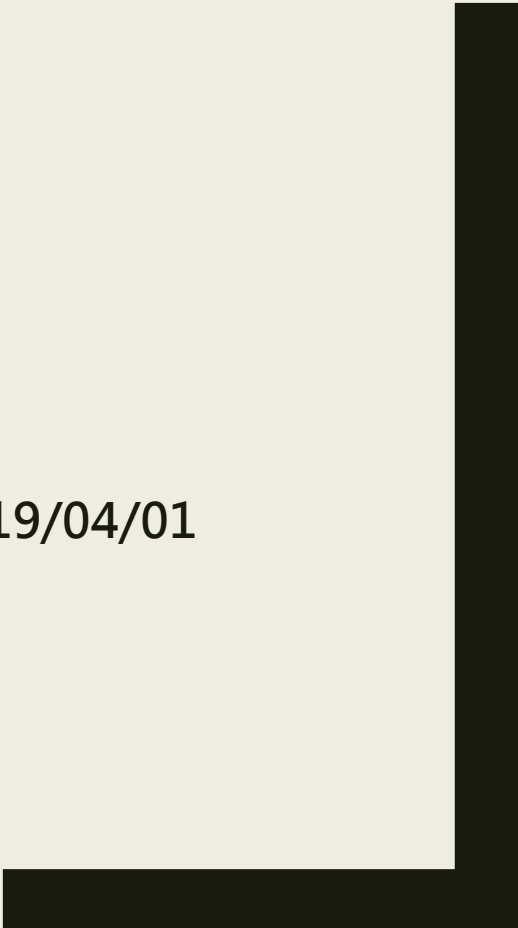




# Lab 4

2019/04/01



# 上機 (1)

## ■ New E3 課程網頁內

The screenshot displays the National Taiwan University Digital Teaching Platform. The top navigation bar is purple with the university's logo and name. A left sidebar contains various management tools categorized into 'Course Information', 'Content Management', and 'Assessment Management'. The 'Content Management' section is active, showing a list of folders: 'Slides 2019/2/18', 'Slides 2019/3/4', and '2019/3/4 Practice'. The '2019/3/4 Practice' folder is highlighted with a red box and a green arrow. The main content area shows the course title '【107下】1190資料結構與物件導向程式設計 Programming' and a section for 'TA Courses'.

課程資訊

- 課程綱要
- 成員
- 公告列表
- 我的郵件

內容管理

- 大綱管理**
- 教材管理
- 作業管理
- 討論區管理
- 試卷管理
- 題庫維護
- 分組管理

評量管理

- 成績管理
- 配分設定

【107下】1190資料結構與物件導向程式設計 Programming

Slides 2019/2/18

Slides 2019/3/4

TA Courses

2019/3/4 Practice

考試時間到才會開啟，  
10分鐘內下載完畢

遲到超過10分鐘，  
該次以0分計

# 上機 (1)

三 國立交通大學 數位教學平台

課程資訊

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【107上】1189計算機概論與程式設計 Int

Quiz1

- Quiz1\_Q1\_sample.c
- Quiz1\_Q2\_sample.c
- Quiz1.pdf

下載資料夾 編修

點擊下載

下載完記得先解壓縮，再開始編寫程式

# 考試規則

1. 可以翻閱你覺得有幫助的兩本書 (教室會斷網!!)
2. 不得作弊，違者依校規論處
3. 若有格式錯誤的情形，會將該題分數  $\times 0.8$  計算
4. 本次練習都只需繳交 **Header file**  
不得更改 `main_Q1.c` 中任何內容  
繳交時請自行將 Header file 檔名改為 學號－題號  
如：0756704-1.h  
註：不需變更 `ifndef`, `define`, `include` 的檔名
5. 總共只有一次繳交機會，請務必確認格式正確後，再舉手找助教繳交。
6. 行動電子產品 (手機、平板電腦等等)請收在包包內，不要放在桌面上或使用它。

# Header file

- Header file contains function declarations and macro definitions to be shared between several source files.
- For example

The image shows two code editors side-by-side. The left editor, titled 'main.c', contains the following code:

```
1  #include <stdio.h>
2  #include "add.h"
3
4  int main(void)
5  {
6      int number;
7      scanf("%d", &number);
8
9      number = do_something(number);
10
11     printf("%d", number);
12
13     return 0;
14 }
15
```

The right editor, titled '\*add.h', contains the following code:

```
1  #ifndef add_H
2  #define add_H
3
4  int do_something(int n){
5      return n + 1;
6  }
7
8  #endif
9
```

Red arrows indicate the relationship between the two files: one arrow points from the `#include "add.h"` line in `main.c` to the header file, and another arrow points from the `do_something` function call in `main.c` to the function definition in `*add.h`.

- In Header file (\*.h) , you can add any function or declaration **except** main function

# Q1 – Rational Number

## Description

Create a class **RationalNumber** with the following capabilities:

- A constructor that reduce or simplifies the input fractions that are not in reduced form.
- Overload the addition(+), subtraction(-), multiplication(\*) and division(/) operators for this class.
- Overload the relational(>, >=) and equality(==) operators for this class.
- A member function **printRational** that print the reduced form

After prompt two fractions, list the result of addition, subtraction, multiplication, division, relational(> or <=), relational(>= or <) and equality(== or !=) of the two fractions sequentially.

**Note: Inputs are all positive integer.**

# Example

## ■ Sample Input 1

1/3

5/3

## ■ Sample Output 1

### HINT

1/3+5/3 2

1/3-5/3 -4/3

1/3\*5/3 5/9

1/3/5/3 1/5

> or <= 1/3<=5/3

>= or < 1/3<5/3

== or != 1/3!=5/3

## ■ Sample Input 2

15/15

60/60

## ■ Sample Output 2

2

0

1

1

1<=1

1>=1

1==1

# Q2 - Mytime

## Description

Create a class **Mytime** with the following capabilities:

- Set a Parametrized Constructor assigning the attribute as the parameter that passed into, and a default constructor setting every attributes as zero.
- Overload addition (+) operator that add both hour and minute attributes.
- Overload subtraction (-) operator that subtract both hour and minute attributes. Former input time always longer than later input time.
- Overload multiplication (\*) operator to multiply a number(int) with both hour and minute attributes.

[Hint] You must consider both “number(int) \* Mytime(object)” and “Mytime (object) \* number(int)” conditions.



# Q2 - Mytime

## Description (cont.)

- Overload increment (++) operator to increase one minute of Mytime object. **You must implement in both prefix and postfix expression**
- Last, please overload (<<) operator from ostream library, in order to get the output in the following format:
  - First of all, you need to insert a underline(\_) between words and numbers
  - While the hour or minute is bigger than 1 (not include 1), please add “s” to make it plural(複數). (e.g. hour<sub>s</sub>/minutes<sub>s</sub>)
  - No need to line feed(換行)!!

[Remind]

There will be not “cout” function in header file, all the cout function will be called in main function!

# Q2 - Mytime

## Input restriction

Hour will be in range 0 to 1000

Minute will be in range 0 to 59

## Judging policy

According to the grading policy of this question, while the judge parameter in the main file is “1”, we will judge the result of implementation including “increment operator overloading in both prefix and postfix way”.

However, in our five judging data, there will be three set of `judge==1` cases.

Please try your best!

# Example

## ■ Sample Input 1

0 1 50 20 7 2 9

## ■ Sample Output 1

1\_hour\_50\_minutes

20\_hours\_7\_minutes

0\_hour\_0\_minute

timeA + timeB 21\_hours\_57\_minutes

timeA \* mult1 3\_hours\_40\_minutes

mult2 \* timeB 181\_hours\_3\_minutes

## ■ Sample Input 2

1 0 4 29 59 7 10

## ■ Sample Output 2

0\_hour\_4\_minutes

29\_hours\_59\_minutes

0\_hour\_0\_minute

timeA + timeB 30\_hours\_3\_minutes

timeA \* mult1 0\_hour\_28\_minutes

mult2 \* timeB 299\_hours\_50\_minutes

timeC 299\_hours\_50\_minutes

timeC 299\_hours\_52\_minutes

Q&A