Programming Languages Homework 3-1

功課習題：

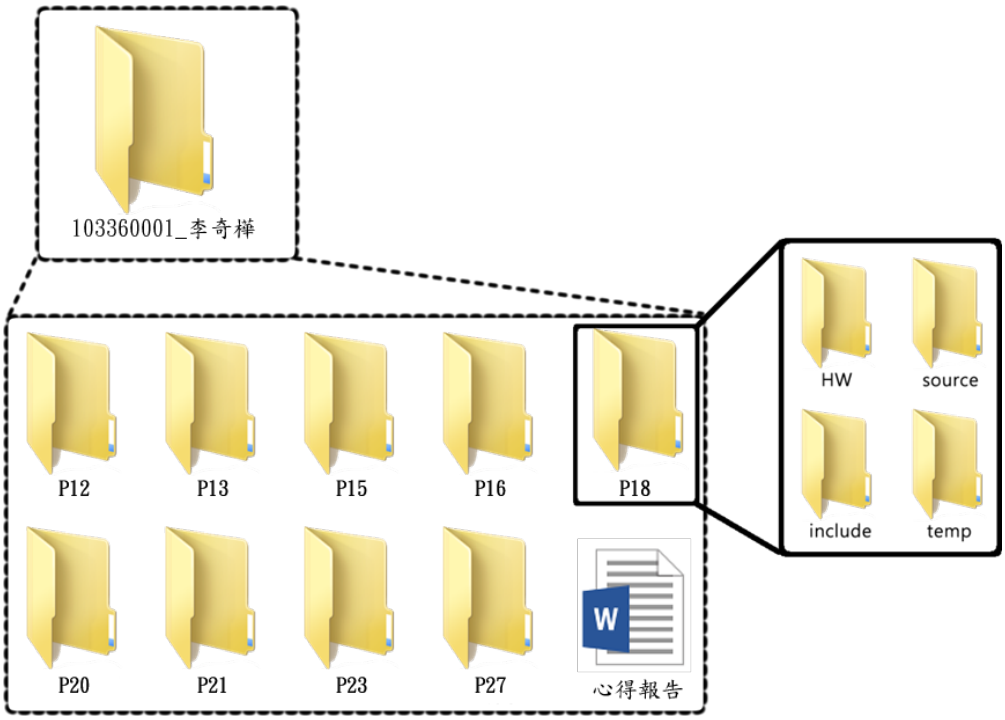
1. P12
2. P13
3. P15
4. P16
5. P18
6. P20
7. P21
8. P23
9. P27

繳交期限：10/25 (四) 晚上 11:59 前

繳交格式：103360001_李奇樺.zip

繳交內容：**心得報告(包含:上傳到 GitHub 的截圖)**和 **Lab 所檢查之程式檔案**，

如下圖



上傳位置：Homework\Upload

帳號、密碼：CC

如無法上傳可 Mail 繳交的作業檔案(zip)至

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Programming Languages Homework 3-2

功課習題：

1. 5.28
2. 5.29
3. 5.34
4. 5.35
5. 5.36 (Towers of Hanoi)

備註：

1.) 未購買課本者請參閱此頁後面，將附上功課習題的掃描圖片(第七版)。

2.) 若使用第六版課本的同學請注意，因習題 5.28 與第七版不同，故此題以新版為主(請參閱此頁後面的第七版習題掃描圖片)。

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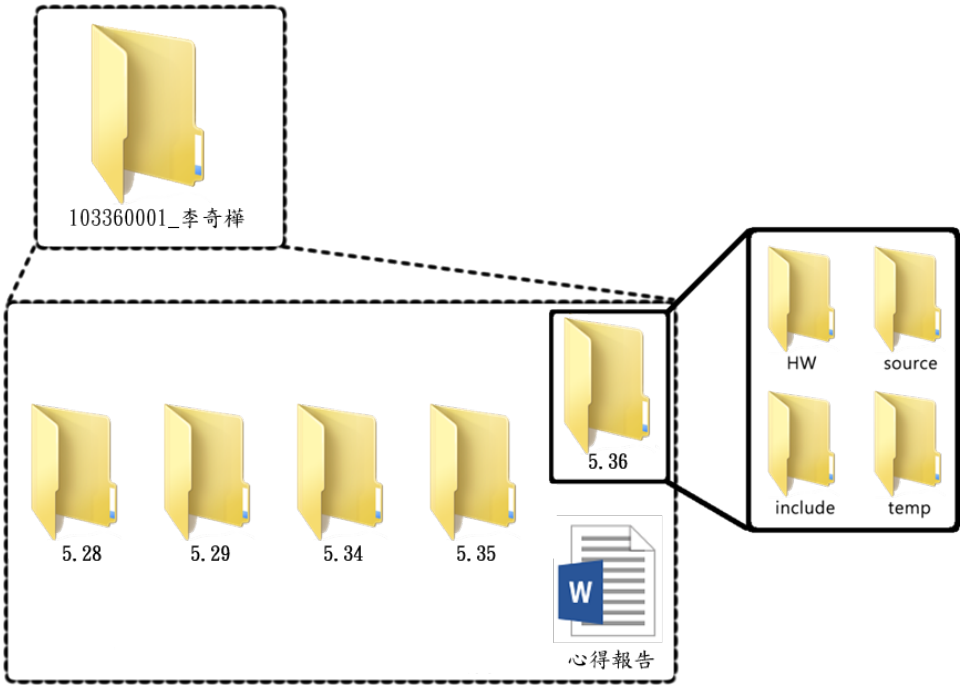
繳交內容：**心得報告(包含:上傳到 GitHub 的截圖)**和 **Lab 所檢查之程式檔案**，如下圖



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5.28、5.29：

5.28 *(Changing the Case)* Write a function that takes an alphabet and returns the alphabet with its case changed. For example, given the character Z, the function should return z.

5.29 *(Least Common Multiple)* The *least common multiple (LCM)* of two integers is the smallest integer that is a multiple of both the numbers. Write function `lcm` that returns the least common multiple of two integers..

5.34、5.35、5.36：

5.34 *(Recursive Exponentiation)* Write a recursive function `power( base, exponent )` that when invoked returns

$$base^{exponent}$$

For example, `power( 3, 4 ) = 3 * 3 * 3 * 3`. Assume that `exponent` is an integer greater than or equal to 1. *Hint:* The recursion step would use the relationship

$$base^{exponent} = base * base^{exponent-1}$$

and the terminating condition occurs when `exponent` is equal to `1` because

$$base^{1} = base$$

5.35 *(Fibonacci)* The Fibonacci series

0, 1, 1, 2, 3, 5, 8, 13, 21, ...

begins with the terms 0 and 1 and has the property that each succeeding term is the sum of the two preceding terms. a) Write a *nonrecursive* function `fibonacci(n)` that calculates the n^{th} Fibonacci number. Use `unsigned int` for the function's parameter and `unsigned long long int` for its return type. b) Determine the largest Fibonacci number that can be printed on your system.

5.36 *(Towers of Hanoi)* Every budding computer scientist must grapple with certain classic problems, and the Towers of Hanoi (see Fig. 5.23) is one of the most famous of these. Legend has it that in a temple in the Far East, priests are attempting to move a stack of disks from one peg to another. The initial stack had 64 disks threaded onto one peg and arranged from bottom to top by decreasing size. The priests are attempting to move the stack from this peg to a second peg under the constraints that exactly one disk is moved at a time, and at no time may a larger disk be placed

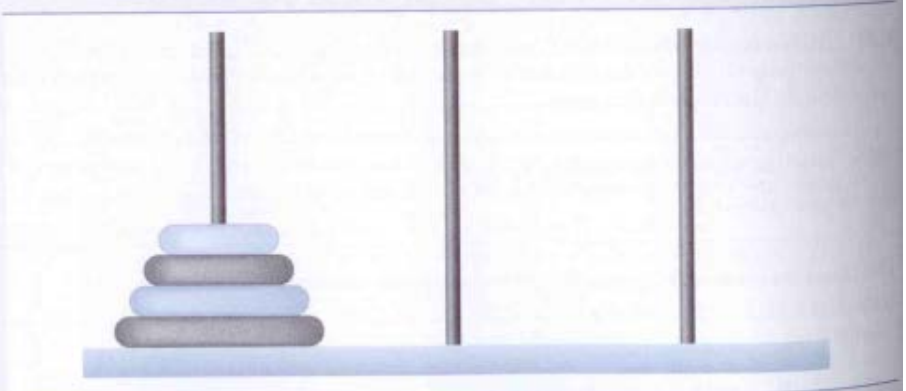

Fig. 5.23 | Towers of Hanoi for the case with four disks.