

## 物件導向程式設計 第三次作業

### Object-Oriented Programming Assignment III

繳交截止日:2019/05/22 23:59,如果在 2019/5/22-2019/5/29 之間繳交則算遲交,並酌扣 20%成績。這之後的時間均不接受補交。

The submission deadline is 2019/5/22 23:59. You can have a late submission between 2019/5/22-2019/5/29 but can earn 80% credit. We do not accept even later submission.

1.

請修改下列程式碼使得使用者可以輸入奇數  $N$ , 並用 *show()* function 印出矩陣。矩陣如下圖所示。

Your program is required to take as input an odd number  $N$ , and prints a matrix shown below by using *show()* function. Your program needs to be written based on the following framework.

```
abstract class parent{
    protected int n;
    /*To Do 建立一個建構元賦值給n;
       Assigned a value of n by constructor. */

    /*To Do 建立一個抽象函數, method() function, method()沒有input且會回傳一個array;
       Define an abstract function() named method() without any inputs,
       and it can return an array.*/
    public void show(int a [][]) {
        for (int i=0; i < n; i++) {
            for(int j=0; j<n; j++)
                System.out.printf("%4d",a[i][j] );
            System.out.println();
        }
    }
}

class hw03_1 extends parent{

    /* To Do 繼承parent class的n
       Inheritance the value n of parent class*/

    /* To Do Override method() function*/

}

public class hw03 {
    public static void main(String args[]) {
        Scanner sc = new Scanner(System.in);
        System.out.print("輸入N值");
        int N = sc.nextInt(); // N is an odd number.
        hw03_1 matrix = new hw03_1(N);
        int [][] b = matrix.method();
        matrix.show(b);
        System.out.println();

        hw03_2 m = new hw03_2(N);
        int [][]c = m.method();
        m.show(c);

    }
}
```

hw03_1									
Input			Output						
7			1	2	4	7	11	16	22
			3	5	8	12	17	23	29
			6	9	13	18	24	30	35
			10	14	19	25	31	36	40
			15	20	26	32	37	41	44
			21	27	33	38	42	45	47
			28	34	39	43	46	48	49
hw03_2									
Input			Output						
7			43	44	45	46	47	48	49
			42	21	22	23	24	25	26
			41	20	7	8	9	10	27
			40	19	6	1	2	11	28
			39	18	5	4	3	12	29
			38	17	16	15	14	13	30
			37	36	35	34	33	32	31

2.

根據下圖程式，請讓程式能夠正常執行並且不會顯示任何輸出。

- 限制 1：不可刪減現有的程式碼。

Consider the code below. Make the code executable. Note that your program does **not print** any output.

- Limit 1: You are **NOT** allowed to delete the code given.

```
4  class hw03
5  {
6      public static void main(String arg[])
7      {
8          BBB b = new BBB(0);
9          b.show();
10     }
11 }
12 abstract class AAA
13 {
14     protected int num1 = 10;
15     AAA(int x) {
16         if(x<3)
17             System.out.println("constructor: You cannot print this line");
18     }
19     void func_1() {
20         System.out.println("func_1: You cannot print this line");
21     }
22     abstract void func_2();
23     private void func_3() {
24         if(num1>0)
25             System.out.println("func_3: You cannot print this line");
26     }
27     final void show() {
28         func_1();
29         func_2();
30         func_3();
31     }
32 }
33
34 class BBB extends AAA
35 {
36     // To Do
37 }
38
```

3.

請寫出一個程式讓使用者可以輸入一個字串，並將其字串按照數字、大寫英文字母、小寫英文字母排序後輸出。排序結果須要有由小大到以及由大到小兩種結果。

Your program is required to take as input a string and sort it by number, uppercase and lowercase. Sorting results need to be from small to large and from large to small.

Input	Output
760025pasghwwwaNFPL	1. 由小到大      002567FLNPaaghpswww
	2. 由大到小      765200PNLFwwwsphgaa
1324FailEd	1. Form small to large    1234EFadil
	2. From large to small    4321FElida