物件導向程式設計 第五次小考

Object-Oriented Programming Quiz 5

1.

請修改下列程式碼使得使用者可以輸入整數 *A*，並用 *show()* function 印出層數為 A 的聖誕樹。

Your program is required to take as input an integer *A*, and prints a Christmas tree of layer *A* by using *show()* function. Your program needs to be written based on the following framework.

```
abstract class parent {


    /*To Do  定義一個抽象函數show();
             Define an abstract function show()*/
}


class child extends parent{
    protected int a;

    /*To Do  用建構元賦值給a;
             The value of a is assigned by constructor. */

    /*To Do  Override show() function, show() 不能有input;
             Override the show() function without any inputs.*/
}
public class parent{
    public static void main(String args[]) {
        Scanner sc = new Scanner(System.in);
        System.out.printf("輸入聖誕樹層數\n");
        int A;
        A = sc.nextInt()
        child ch = new child(A);
        ch.show();
    }
}
```

Input	Output
5	please input A 5 * ***** ├ 1 *** ******* ├ 2 ***** ********* ├ 3 ******* *********** ├ 4 ********* ************* ├ 5 * *

2.

請修改下列程式碼並在 Main 使用 class Math 的函數 *show0* 輸出一個字串為 **"ans=" + *ans***。你的程式將符合以下限制。

- 限制 1：class Math 內的 *pi* 初始值為 3.14 且可以被子類別存取但不可以被修改。
- 限制 2：class Math 內的 *ans* 僅可以被子類別存取也可以被修改。
- 限制 3：class Compute 內的 *a* 、*b* 初始值分別為 3、11。更動 Main 中 *com1* *a* 或 *b* 的值 *com2* 內的 *a* 或 *b* 也會變動
- 限制 4：*mul1()* function 內賦予 *ans* 的值為 *a*b*pi*，該 ***pi*** 被宣告於 class Math 內並非宣告於 class Compute 內。
- 限制 5：*mul2()* function 內賦予 *ans* 的值為 *a*b*pi*，該 ***pi*** 被宣告於 class Compute 內並非宣告於 class Math 內。

Please revise the code and use the *show()* function to output a string **"ans=" + ans**.

- Limit 1：The initial value of *pi* in class Math is 3.14 and can be accessed by subclass but cannot be modified.
- Limit 2：The initial value of *ans* in class Math can be **only** accessed and modified by subclasses.
- Limit 3: The initial values of *a* and *b* in the class Compute are 3 and 11 respectively. If the value of *a* or *b* in *com1* is changed, so does the value of *a* or *b* in *com2*.
- Limit 4: Given the value to *ans* in *mul1()* function is *a*b*pi* and the *pi* is declared in class Math and is not declared in class Compute.
- Limit 5: Given the value to *ans* in *mul2()* function is *a*b*pi* and the *pi* is declared in class Compute and is not declared in class Math.

```java
package college;
import java.util.Scanner;

public class main
{
    public static void main(String[] args)
    {
        Compute com1 = new Compute();
        Compute com2 = new Compute();
        com1.mul1();
        com1.show();
        com1.a=7;
        com2.mul1();
        com2.show();
    }
}
    class Math
    {
        // To Do 增加"2行"且只能宣告變數
        // You can add only "two lines" and only declare variables
        public void show()
        {
            System.out.println(...); // To Do 修改此行
                                     // Revise this line
        }
    }

    class Compute extends Math
    {
        // To Do "最多"增加2行且只能宣告變數
        // You can add at most two lines and only declare variables
        int pi=5;

        public void mul1()
        {
            // To Do 增加1行
            // Add one line.
        }

        public void mul2()
        {
            // To Do 增加1行
            // Add one line.
        }
    }
```

3.

根據下圖結果，輸出分別是 true 與 false，請以文字說明兩者 equals 之間的差異。

Consider the code below. The results are true and false, respectively. Please explain the difference between the two equals and print your explain in the text.

```
4  class test05
5  {
6      public static void main(String arg[])
7      {
8          String a = new String("222");
9          String b = new String("222");
10         System.out.printf("%b\n", a.equals(b));
11
12
13         AA a1 = new AA();
14         AA a2 = new AA();
15         System.out.printf("%b\n", a1.equals(a2));
16     }
17 }
18
19 class AA
20 {
21     int a = 0;
22 }
```

```
<terminated> test05 [Java App
true
false
```