106-01 資一乙 程式設計 第一次上機考

學號： **姓名：**

一、請舉例說明陣列(array)的兩項優點。（10%）

二、請舉例說明函數(function)的兩項優點。（10%）

三、程式設計: （所有程式須能夠多次執行，並在桌面下建置以**學號**為名稱之資料夾，第 1 題以 test1.cpp 為檔名，以此類推）

1. 輸入列數後，輸出相對的圖形。(10%)

2. 假設某月份為 31 天，輸入該月份 1 日的星期數，輸出該月分之月曆。(10%)

3. 輸入正整數 n，輸出如下數列，直到數字超過 n 為止。（10%）
   1, 2, 2, 3, 3, 3, 4, 4, 4, 4, 5, 5, 5, 5, 5 ……

4. 輸入正整數 n，輸出 n*n 乘法表。(10%)

5. 輸入西元年、月、日，輸出此日期是該年的第幾天?。（10%）

6. 請輸入一個字串(最多 10 個字元)，將字串中的文字大小寫互換後輸出。（10%）

7. 輸入一些正整數（-1 代表結束），輸出這些整數中的最大值與最小值。（10%）

8. 輸入一些符號（a~z，0 代表結束），輸出各種符號出現的次數。（10%）

9. 輸入 n 個正整數(n<=10，-1 代表結束)，以氣泡排序法輸出由小排到大的結果。（15%）

10. 假設西元 2000 年 1 月 1 日為星期六。分三列輸入某年某月某日，輸出該日期是星期幾。（15%）

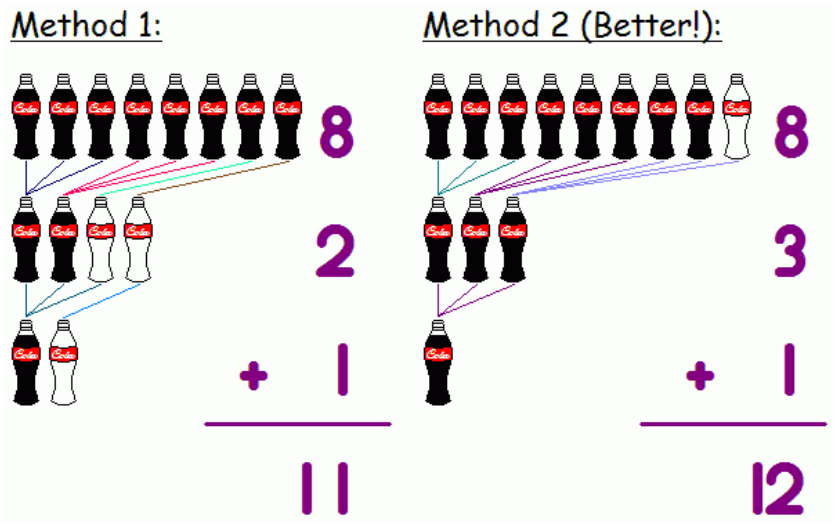
11. **Cola/11150** (20%)

You see the following special offer by the convenience store:

“A bottle of Choco Cola for every 3 empty bottles returned”

Now you decide to buy some (say N) bottles of cola from the store. You would like to know how you can get the most cola from them. The figure below shows the case where N = 8. Method 1 is the standard way: after finishing your 8 bottles of cola, you have 8 empty bottles. Take 6 of them and you get 2 new bottles of cola. Now after drinking them you have 4 empty bottles, so you take 3 of them to get yet another new cola. Finally, you have only 2 bottles in hand, so you cannot get new cola any more. Hence, you have enjoyed 8 + 2 + 1 = 11 bottles of cola.

You can actually do better! In Method 2, you first borrow an empty bottle from your friend (?! Or the storekeeper??), then you can enjoy 8 + 3 + 1 = 12 bottles of cola! Of course, you will have to return your remaining empty bottle back to your friend.



Input (sample input: 8)

Input consists of several lines, each containing an integer N (1 ≤ N ≤ 200).

Output (Sample output: 12)

For each case, your program should output the maximum number of bottles of cola you can enjoy. You may borrow empty bottles from others, but if you do that, make sure that you have enough bottles afterwards to return to them.