Programming Design, Spring 2014

Suggested Solution for Homework 02

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Problem 1 (10 points)

From the message that the number of dollars carried by the soldier can never be greater than $65,535, we can infer that there are only number of 65536 (2^{16})-combinations in the game. When the game was being developed, the programmer might use only two bytes (16 bits) to store the number of dollars. The main reason why the number of dollars carried by the soldier can never be greater than $65,535 is because of the design of this game. The designer must set the bound of the money you can carry, or there will be many bugs (e.g., overflow) while playing this game. But, the cost of memory and hard disk is decreasing with technological advancements. We do not consider this problem nowadays.

由遊戲的金錢上限來推斷，該遊戲在開發的時候設定金錢只能存在 0~65535 的可能性，也就是 65536（2^{16}）的組合數，該款遊戲程式可能只使用 2 bytes（16 bit）來儲存金額，至於為什麼會當你金額達到 $65,540 卻只顯示上限 $65,535 ，是因為溢位（Overflow）可能會造成遊戲進行的 BUG 因此設計師必須制定上下限的遊戲規則。但隨者科技的進步硬體越來越便宜，現在設計遊戲並不需要考慮節省記憶體空間的問題，使遊戲的體驗更加豐富。

Problem 2 (10 points)

(a) (3 points)

The program lets user input two characters. If the characters are ‘a’ and ‘b’, the string “Here. \n” will be printed. If not, “There. \n” will be printed.

(b) (3 points)

The program will always output “There. \n”.

(c) (3 points)

```
#include <iostream>
using namespace std;

int main(){
        char c1 = 0, c2 = 0;

        cin >> c1;
        cin >> c2;

        if (c1 == 'a')
        {
                if (c2 == 'b')
                        cout << "Here.\n";
                else
                        cout << "There.\n";
        }
        else if (c1 == 'b')
        {
                if (c2 == 'a')
                        cout << "Here.\n";
                else
                        cout << "There.\n";
        }
        else
                cout << "There.\n";
        return 0;
}
```

Problem 3 (80 points)

See the file "PD14-02a.cpp".

Bonus: Problem 4 (20 points)

See the file "PD14-02b.cpp".