NUMBER GUESSING

2015 NCKUEE Freshman Camp

2015/08/19

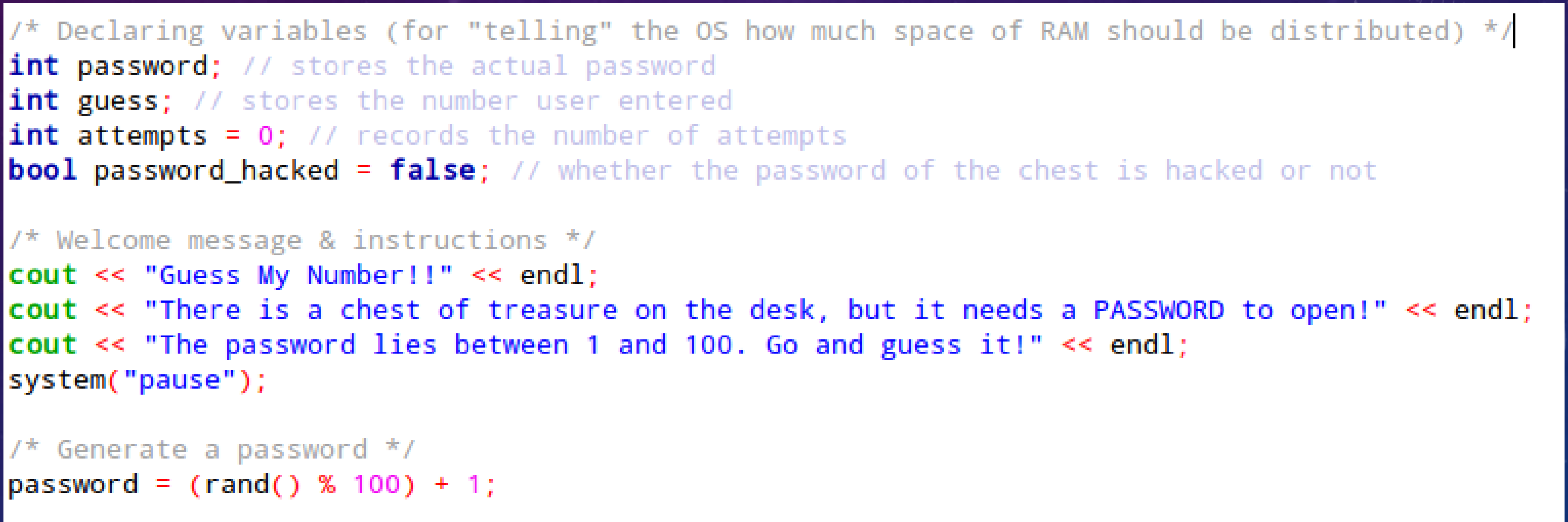
Guess My Number!

- The system randomly generate a secret number, lies between 1 and 100
- We guess the number according to the hint (too big / too small) after each turn
- Until we guessed the secret number
- 有玩過「終極密碼」吧？

Main Steps

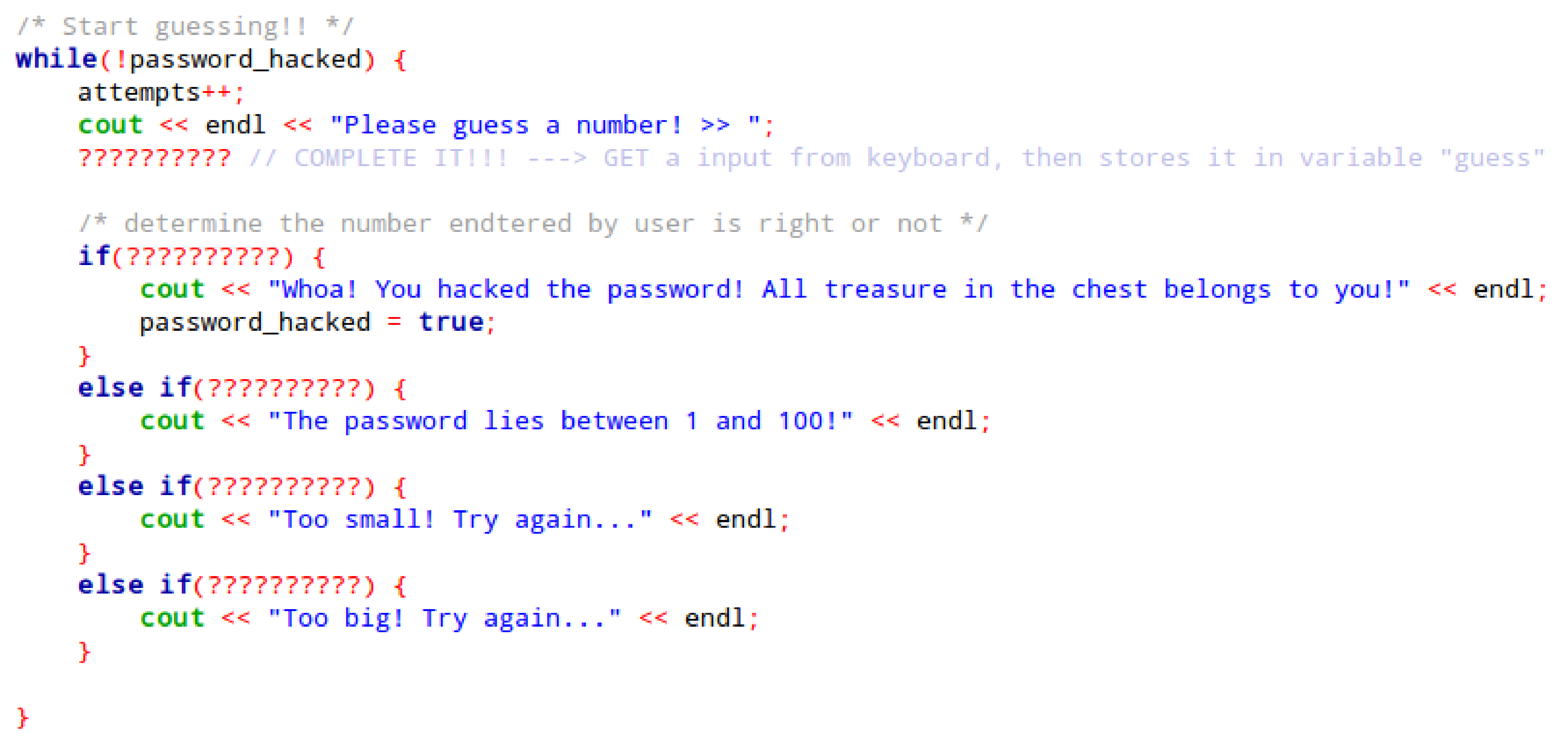
1. Randomly generate a secret number between 1 and 100
2. User inputs his/her guess via keyboard
3. Determine this number is illegal or not
    - If so, output the error message
4. Give the user feedback (too big/small)
    - If right, congratulations to the user and give him/her comments

Step.1 指引與隨機生成數字



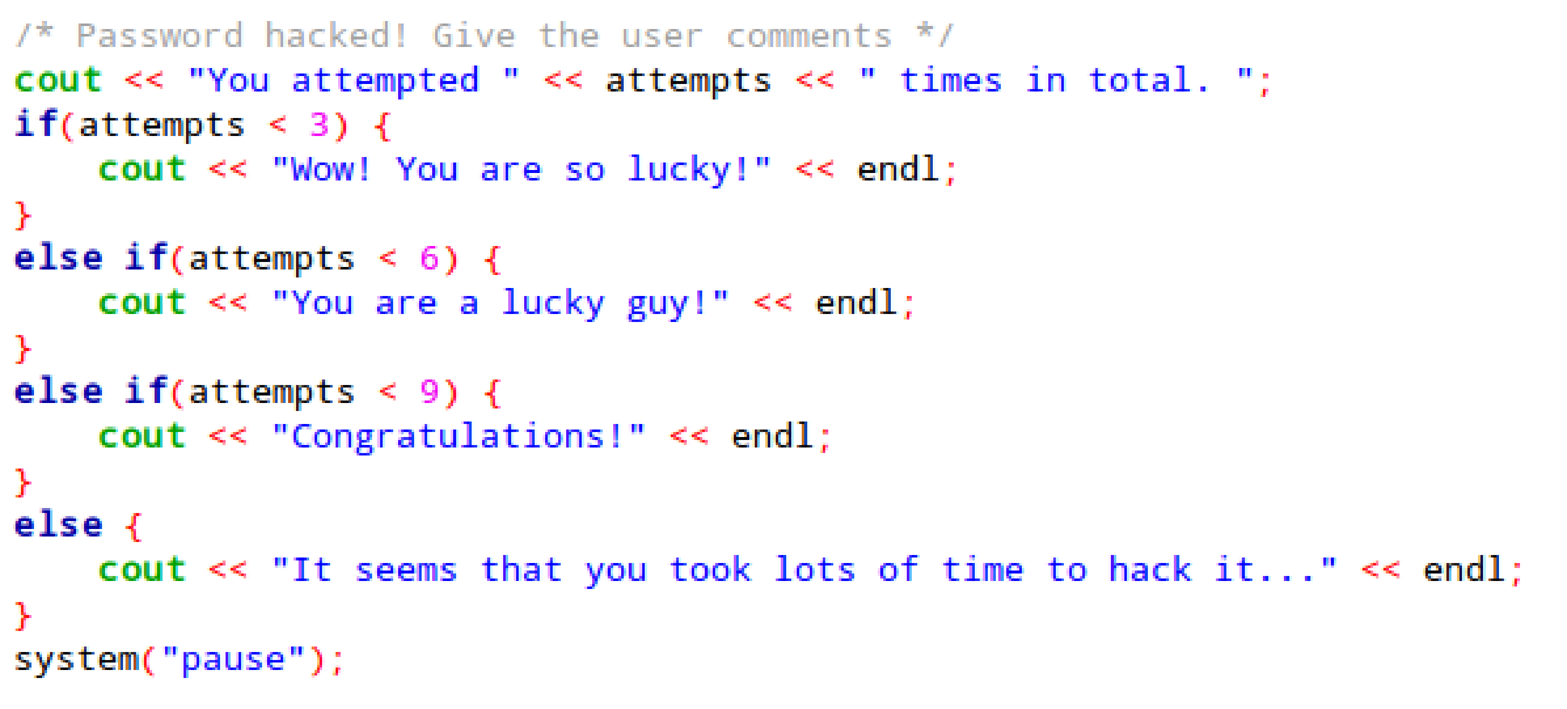
```
/* Declaring variables (for "telling" the OS how much space of RAM should be distributed) */
int password; // stores the actual password
int guess; // stores the number user entered
int attempts = 0; // records the number of attempts
bool password_hacked = false; // whether the password of the chest is hacked or not

/* Welcome message & instructions */
cout << "Guess My Number!!" << endl;
cout << "There is a chest of treasure on the desk, but it needs a PASSWORD to open!" << endl;
cout << "The password lies between 1 and 100. Go and guess it!" << endl;
system("pause");

/* Generate a password */
password = (rand() % 100) + 1;
```

Step.2 開始猜、給回饋



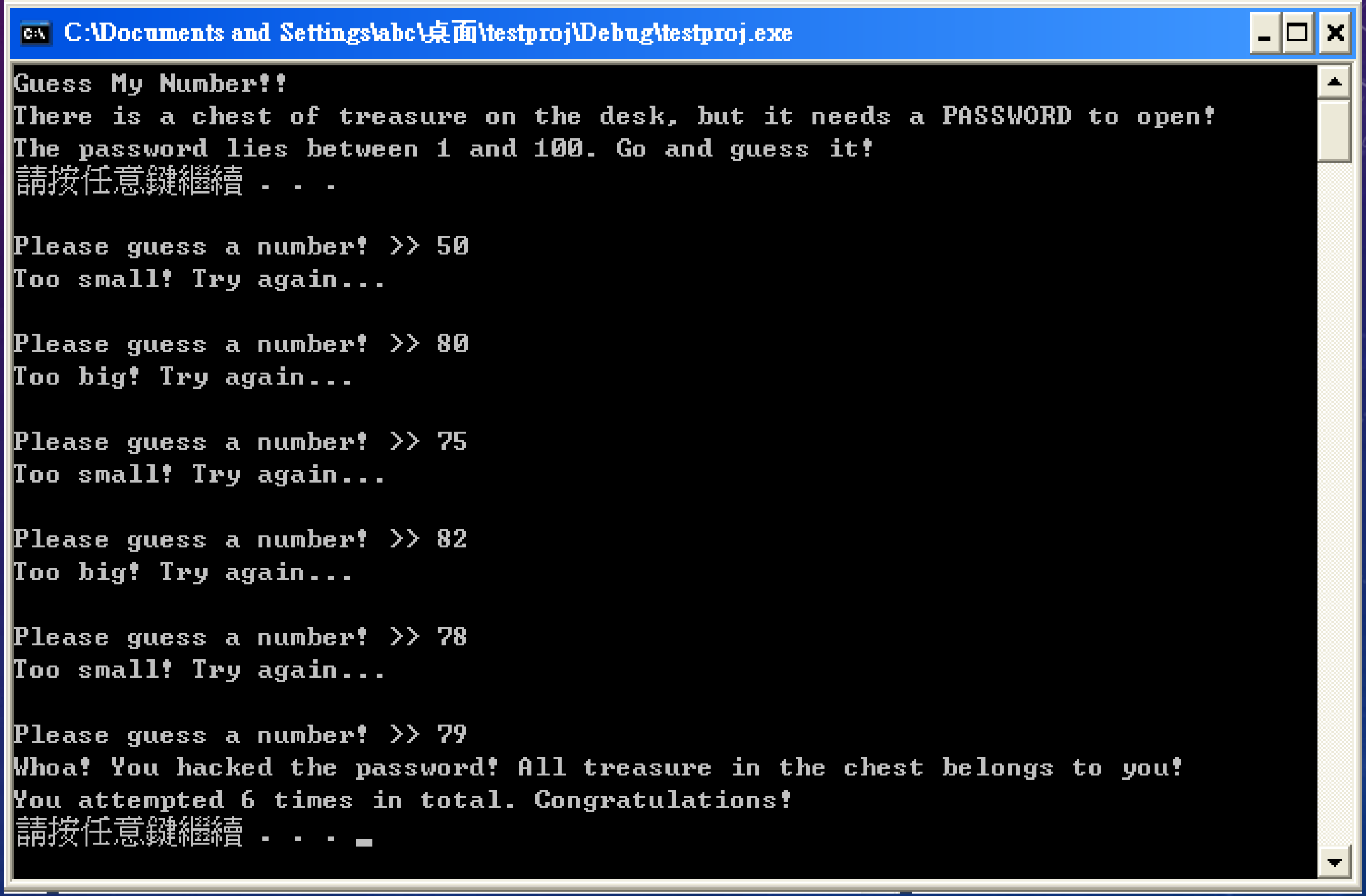
```
/* Start guessing!! */
while(!password_hacked) {
    attempts++;
    cout << endl << "Please guess a number! >> ";
    ?????????? // COMPLETE IT!!! ---> GET a input from keyboard, then stores it in variable "guess"

    /* determine the number endtered by user is right or not */
    if(??????????) {
        cout << "Whoa! You hacked the password! All treasure in the chest belongs to you!" << endl;
        password_hacked = true;
    }
    else if(??????????) {
        cout << "The password lies between 1 and 100!" << endl;
    }
    else if(??????????) {
        cout << "Too small! Try again..." << endl;
    }
    else if(??????????) {
        cout << "Too big! Try again..." << endl;
    }

}
```

Step.3 若猜對、則恭喜並評分



```
/* Password hacked! Give the user comments */
cout << "You attempted " << attempts << " times in total. ";
if(attempts < 3) {
    cout << "Wow! You are so lucky!" << endl;
}
else if(attempts < 6) {
    cout << "You are a lucky guy!" << endl;
}
else if(attempts < 9) {
    cout << "Congratulations!" << endl;
}
else {
    cout << "It seems that you took lots of time to hack it..." << endl;
}
system("pause");
```

Demo



C:\Documents and Settings\abc\桌面\testproj\Debug\testproj.exe

```
Guess My Number!!
There is a chest of treasure on the desk, but it needs a PASSWORD to open!
The password lies between 1 and 100. Go and guess it!
請按任意鍵繼續 . . .

Please guess a number! >> 50
Too small! Try again...

Please guess a number! >> 80
Too big! Try again...

Please guess a number! >> 75
Too small! Try again...

Please guess a number! >> 82
Too big! Try again...

Please guess a number! >> 78
Too small! Try again...

Please guess a number! >> 79
Whoa! You hacked the password! All treasure in the chest belongs to you!
You attempted 6 times in total. Congratulations!
請按任意鍵繼續 . . .
```

From Ideas to Algorithms

- 進入更難一點的練習前，我們想先談談這件事
- 關於「**我有個想法，但不知道怎麼變成程式**」
- 許多初學者遭遇的第一關

From Ideas to Algorithms

- 我們大致能依照以下步驟：
  - **首先要先知道這個問題的要求，決定該提供什麼功能**
  - **然後要滿足這些功能，應該需要輸入什麼東西、又應該輸出什麼、需要多少空間存這些變數**
  - **把解決這個問題的步驟一一列出，並畫成流程圖**
    - 哪時候要提示使用者輸入資料
    - 哪時程式要進行運算、如何運算
    - 哪時要把資料輸出
  - **再根據這些流程圖轉換成程式語言**

The Meaning of Variables

- Variable (變數)
  - a symbolic name associated with a value and whose associated value may be changed
- 為什麼要「宣告」變數
  - E.g. `int i; double d; char c;`
  - 告訴作業系統要預先分配多少記憶體空間給這些值
  - C++ 是靜態型別語言，必須在編譯前就明確指出其型態

Tips: 寫好程式的小訣竅

- 勤寫註解(非常重要！)
- 使用有意義的變數名稱
- 保持各層級縮排一致

- *「傻瓜都能寫出電腦能理解的程式；*
- *優秀的工程師寫出的是人類能讀懂的程式。」*

QUESTIONS?

Just Ask!

THANK YOU!

Enjoy Coding!