

GECG10069 (561085) F25: Introduction to Programming (C++)

Lab 3 : IOStream



What you will learn from Lab 3

In this laboratory, you will further explore special output symbols and practice using variables in your programs.

TASK 3-1 : HOW TO USE INPUT FILE STREAM

- ✓ Add an input text file

```
#include <iostream>
using namespace std;
int main()
{
    cout << "Hello, World!";
    return 0;
}
```

- ✓ Select “New Text file”

```
#include
using nam
int main(
{
    cout << "Hello, World!";
    return 0;
}
```

- ✓ Filename and content can be modified

```
Sample text file!
```

- ✓ Try to read the content in “sample1.txt”

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

int main()
{
    ifstream iff;
    string words;
    iff.open("sample1.txt");
    getline(iff, words);
    cout << words << endl;
    return 0;
}
```

TASK 3-2 : EXAMPLE

- ✓ Try to mix getline() and cin
✓ Align output through setw() and setprecision()

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

int main() {
    string subject;
    int score;

    cout << "Enter subject name: ";
    getline(cin, subject); // 讀科目名稱

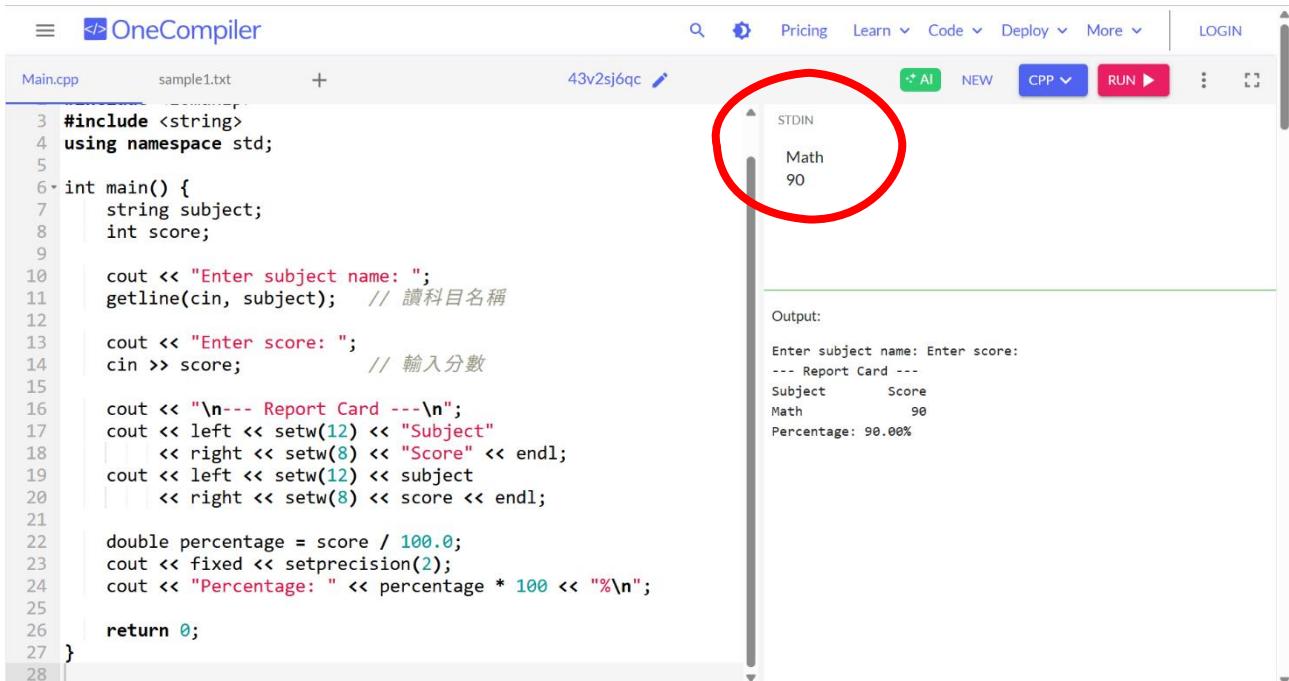
    cout << "Enter score: ";
    cin >> score; // 輸入分數

    cout << "\n--- Report Card ---\n";
    cout << left << setw(12) << "Subject"
        << right << setw(8) << "Score" << endl;
    cout << left << setw(12) << subject
        << right << setw(8) << score << endl;

    double percentage = score / 100.0;
    cout << fixed << setprecision(2);
    cout << "Percentage: " << percentage * 100 << "%\n";

    return 0;
}
```

- ✓ Enter input then press “RUN” button.

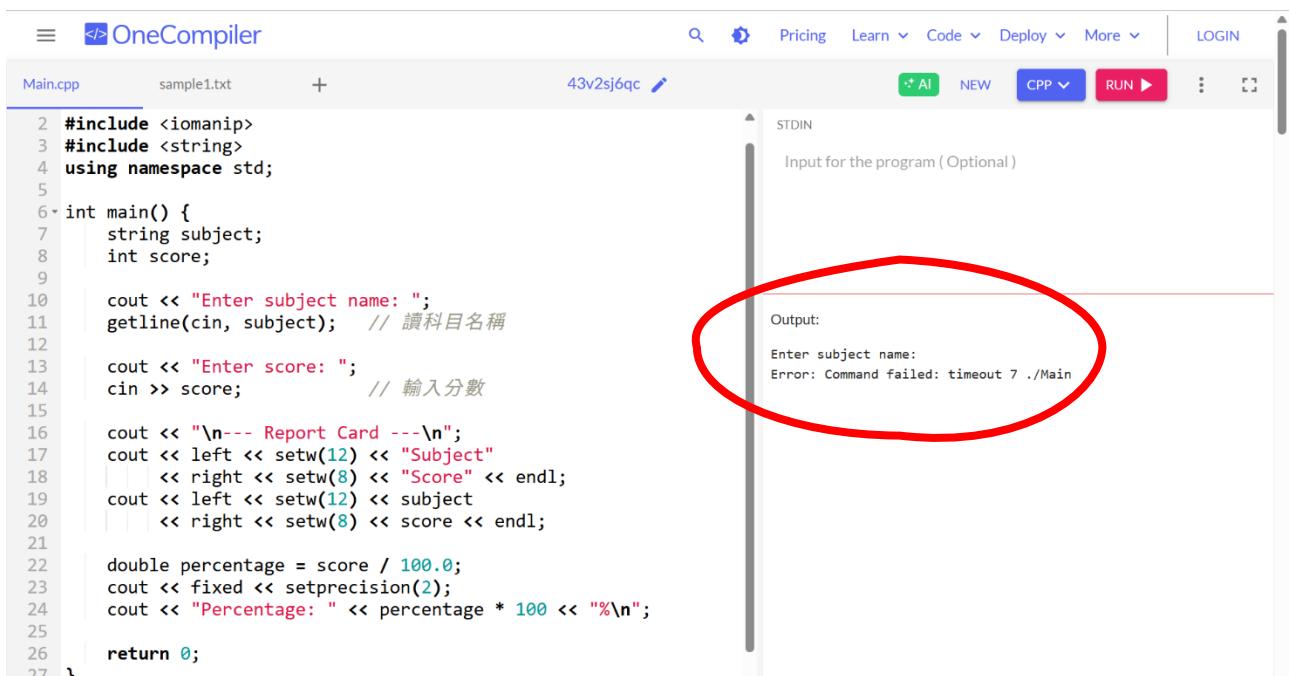


```
3 #include <iomanip>
4 #include <iostream>
5 using namespace std;
6
7 int main() {
8     string subject;
9     int score;
10
11     cout << "Enter subject name: ";
12     getline(cin, subject); // 讀科目名稱
13
14     cout << "Enter score: ";
15     cin >> score; // 輸入分數
16
17     cout << "\n--- Report Card ---\n";
18     cout << left << setw(12) << "Subject"
19         << right << setw(8) << "Score" << endl;
20     cout << left << setw(12) << subject
21         << right << setw(8) << score << endl;
22
23     double percentage = score / 100.0;
24     cout << fixed << setprecision(2);
25     cout << "Percentage: " << percentage * 100 << "%\n";
26
27 }
28
```

STDIN
Math
90

Output:
Enter subject name: Enter score:
--- Report Card ---
Subject Score
Math 90
Percentage: 90.00%

- ✓ If you forget to enter input first, it will take a while and show the following error.



```
2 #include <iomanip>
3 #include <iostream>
4 using namespace std;
5
6 int main() {
7     string subject;
8     int score;
9
10    cout << "Enter subject name: ";
11    getline(cin, subject); // 讀科目名稱
12
13    cout << "Enter score: ";
14    cin >> score; // 輸入分數
15
16    cout << "\n--- Report Card ---\n";
17    cout << left << setw(12) << "Subject"
18        << right << setw(8) << "Score" << endl;
19    cout << left << setw(12) << subject
20        << right << setw(8) << score << endl;
21
22    double percentage = score / 100.0;
23    cout << fixed << setprecision(2);
24    cout << "Percentage: " << percentage * 100 << "%\n";
25
26
27 }
```

STDIN
Input for the program (Optional)

Output:
Enter subject name:
Error: Command failed: timeout 7 ./Main

EXERCISE 3-1 : SIMPLE FILE INPUT PRACTICE

Description -

You are given a file named “*data.txt*” with **exactly three lines**.
Each line in the file contains **two integers (*int*)**.

For each line,
calculate its **sum**, **difference**, **product**, and **quotient** of the two numbers.

Print the results line by line as the sample output provided below.

Formatting Rules -

- This problem **doesn't set a strict output format requirement**. As long as the students generate their output similar to the sample output with correct computation results, the TA can accept the demo as correct.

Constraints -

- *all_input_numbers* ∈ integer (*int*)
- *calculation_result* ∈ integer (*int*)
- *The second number in each row* ≠ 0

Only One Testcase -

data.txt (Please use the function in **<fstream>** to read it.)

8 2
15 3
20 5

Sample Output (You only need to print it (use **cout**). Do not export any files.)

Line 1: Sum=10, Diff=6, Prod=16, Quot=4
Line 2: Sum=18, Diff=12, Prod=45, Quot=5
Line 3: Sum=25, Diff=15, Prod=100, Quot=4

EXERCISE 3-2 : CAFÉ RECEIPT

Description -

Read the given **product name (string)**, **quantity (int)**, and **unit price (double)**, **cashier name (string)**.

Print a small receipt with aligned columns and **two-decimal numbers**.

Input (four lines, in this order) -

- **product name**
- quantity
- unit price
- **cashier name**

Formatting Rules -

- Header row with columns: Item, Qty, Unit, Total
- Use **setw** to align:
 - Item: left, width 20
 - Qty: right, width 6
 - Unit: right, width 10
 - Total: right, width 12
- Use **fixed** and **setprecision(2)** for all the numbers **except quantity(Qty)**.
- Total = quantity * unit_price
- Print exactly the four columns.
- Print the **cashier name** in the last line

Reminder -

- Please notice that the **names** might contain more than one words
- We use **std::cin** and its relevant functions (**ignore()**, **getline()**...) to get all the inputs in this problem

Constraints -

- $0 < \text{quantity}, \text{unit_price} < 10000$
- $\text{length}(\text{product name}) < 18$
- $\text{length}(\text{cashier name}) < 100$
- $0 < \text{quantity} * \text{unit_price} < 10000$

Sample Testcases -

Attention:

If the sample input lines contain trailing whitespace (行尾多餘空格) on your end,
please remove it manually to avoid errors between `cin` and `getline()`

Sample Input - 1

Latte
77
45.50
TungSahur

Sample Output - 1

Item	Qty	Unit	Total
Latte	77	45.50	3503.50
TungSahur			

Sample Input - 2

Diamond Latte
1
9999.9
Tralalero Tralala

Sample Output - 2

Item	Qty	Unit	Total
Diamond Latte	1	9999.90	9999.90
Tralalero Tralala			

Item	Qty	Unit	Total
Latte	77	45.50	3503.50
TungSahur			