

# NCKU Programming Contest Training Course

## introduction & IO

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**Jingfei Yang**

`e84016184@mail.ncku.edu.tw`

<http://myweb.ncku.edu.tw/~e84016184/io.pdf>

Department of Computer Science and Information Engineering  
National Cheng Kung University  
Tainan, Taiwan



# Online Judge introduction

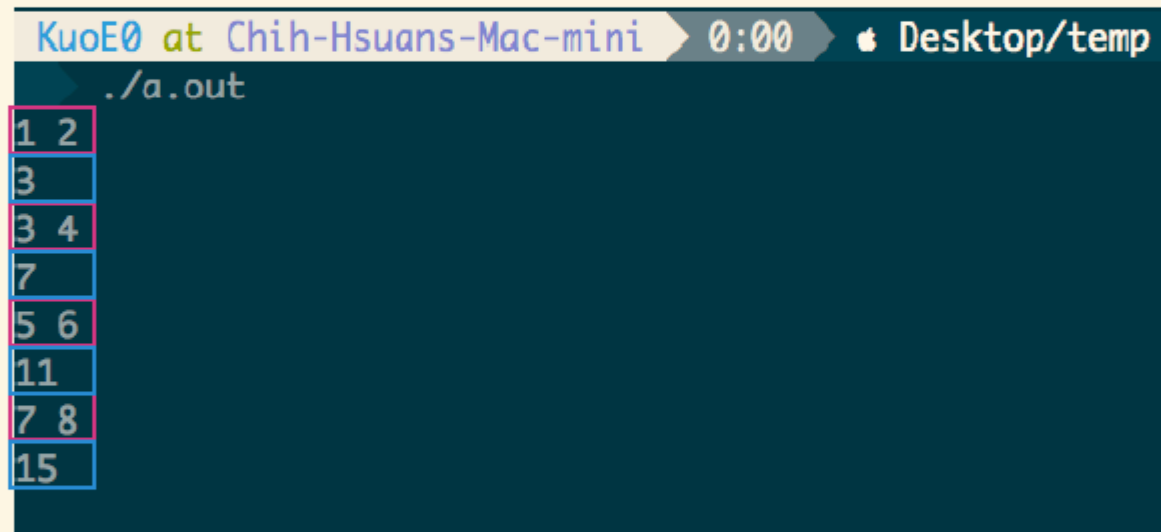
- [POJ](#) (PKU Online Judge)



- [UVa](#) online judge -> useful tool: [uHunt](#)



# Standard Input & Output



A terminal window titled "KuoE0 at Chih-Hsuans-Mac-mini" with a timer at "0:00" and the path "Desktop/temp". The prompt is `./a.out`. The input is shown on the left, with each line highlighted by a red box: "1 2", "3", "3 4", "7", "5 6", "11", "7 8", and "15". The output is shown on the right, with each line highlighted by a blue box: "1 2", "3", "3 4", "7", "5 6", "11", "7 8", and "15".

```
KuoE0 at Chih-Hsuans-Mac-mini 0:00 Desktop/temp
./a.out
1 2
3
3 4
7
5 6
11
7 8
15
```

- 標準輸入
- 標準輸出

標準輸入→由鍵盤輸入

標準輸出→由螢幕輸出



# Problem Format

## Description

問題描述

Calculate  $a+b$

## Input

輸入格式

Two integer  $a, b$  ( $0 \leq a, b \leq 10$ )

## Output

輸出格式

Output  $a+b$

## Sample Input

輸入範例

1 2

## Sample Output

輸出範例

3

## A+B Problem

Time Limit: 1000MS

Memory Limit: 10000K

Total Submissions: 342704

Accepted: 190305

時間、記憶體限制

# Multiple Test Case

```
1 2
3 4
5 6
7 8
```

input file



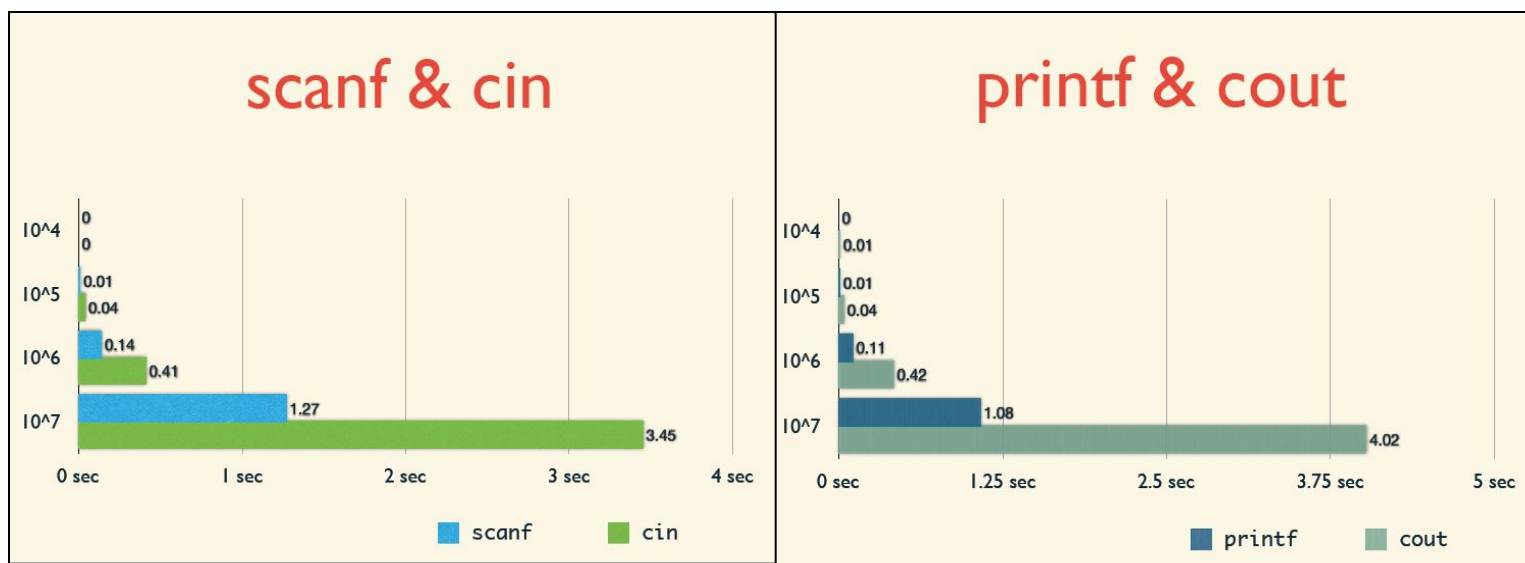
```
3
7
11
15
```

output file

# I/O for contest

- Input  
scanf, gets, getchar, cin.....
- Output  
printf, puts, putchar, cout.....

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



# I/O for contest

- Input: Multiple Test Cases
  - Given the number of test cases

```
/* Given Test cases # */
```

```
...
```

```
int tc,a,b;
```

```
scanf("%d",&tc);
```

```
while(tc--) {
```

```
    scanf("%d%d",&a,&b);
```

```
    printf("%d\n",a+b);
```

```
}
```

```
...
```

## A+B Problem

[Sample Input]

3

1 2

3 4

0 4

[Sample Output]

3

7

4





# I/O for contest

- Input: Multiple Test Cases
- 2. Terminated by special values

```
/* Until zero */  
...  
int n;  
while(scanf("%d",&n)==1 && n) {  
    printf("Hi, %d.\n",n);  
}  
...
```

Hi, "input #".

[Sample Input]

30  
10  
25  
0

[Sample Output]

Hi, 30.  
Hi, 10.  
Hi, 25.

# I/O for contest

- Input: Multiple Test Cases
- 3. Terminated by EOF signal

```
/* Until EOF */  
...  
int n;  
while(scanf("%d",&n)!=EOF) {  
    printf("Hi, %d.\n",n);  
}  
...
```

Hi, "input #".

[Sample Input]

30  
10  
25

[Sample Output]

Hi, 30.  
Hi, 10.  
Hi, 25.

# End Of File

若題目未指定測資終止條件，則為判斷 EOF 作為終止條件！

scanf

```
while (scanf() != EOF)
{
    ...
}
```

fgets

```
while (fgets() != 0)
{
    ...
}
```

cin

```
while (cin >> x)
{
    ...
}
```

# I/O for contest

- Output: Case number & Blank lines
  1. Blank line after all test cases

```
/* \n\n */
```

```
...
```

```
int a,b,cs=1;
```

```
while(scanf("%d%d",&a,&b)!=EOF){  
    printf("Case %d: %d\n\n",cs++,a+b);  
}
```

```
...
```

## A+B Problem

[Sample Input]

```
1 2  
3 4  
0 4
```

[Sample Output]

Case 1: 3

Case 2: 7

Case 3: 4



# I/O for contest

- Output: Case number & Blank lines  
2. Separated by blank line

```
/* Separated */
```

```
...
```

```
int a,b,cs=1;
```

```
while(scanf("%d%d",&a,&b)!=EOF){
```

```
    if(cs>1) putchar("\n");
```

```
    printf("Case %d: %d\n",cs++,a+b);
```

```
}
```

```
...
```

## A+B Problem

[Sample Input]

1 2

3 4

0 4

[Sample Output]

Case 1: 3

Case 2: 7

Case 3: 4



# I/O for contest

- Cutting Skill: String Token

```
#include<cstring>
```

```
...
```

```
gets(str);
```

```
char token[]=" ",*ptr;
```

```
for( ptr=strtok(str,token); ptr; ptr=strtok(NULL,token) )  
{
```

```
    /* ptr is one token */
```

```
}
```

```
...
```

[Sample Input]

Electron ICPC

kk free999 kevinx6000

[Sample Output]

2: Electron & ICPC

3: kk & free999 & kevinx6000



# Advanced Parsing Skill

**strtok** Split string into tokens.

```
char* strtok( char *str, const char *delimiters );
```

str: 欲切割之字串

delimiters: 分隔字符字串

return value: 指向當前切割字串之指標，若切割完畢則回傳 NULL

# strtok

original string:

A “corpus” is a collection of texts of written (or spoken) language presented in electronic form.

take out all words:

A	corpus	is	a
collection	of	texts	of
written	or	spoken	language
presented	in	electronic	form



```
char str = "A \"corpus\" is a collection of texts of  
written (or spoken) language presented in electronic  
form."
```

```
for ( char *token = strtok( str, " \".\" ); token !=  
NULL; token = strtok( NULL, " \".\" ) ) {  
    puts( token );  
}
```

A white notepad icon with a red vertical margin line on the left and horizontal ruling lines. The text "input file" is written in blue cursive script. Below the notepad is a solid blue rectangular base.

input file

**TXT**

A white notepad icon with a red vertical margin line on the left and horizontal ruling lines. The text "output file" is written in blue cursive script. Below the notepad is a solid blue rectangular base.

output file

**TXT**

# I/O for contest

- File I/O: freopen

```
/* freopen */  
  
...  
freopen("f1.in", "r", stdin);  
freopen("f1.out", "w", stdout);  
while(scanf(...) != EOF){  
    printf(...);  
}  
  
...
```



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# Thank you for your listening!

# Practice

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- Uva (5)  
100, 579, 10424, 11727, 11984
- POJ (5)  
1000, 1004, 1298, 1450, 2159

