NCKU Programming Contest Training Course
introduction & IO
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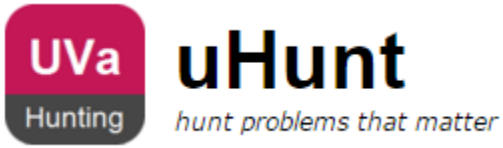
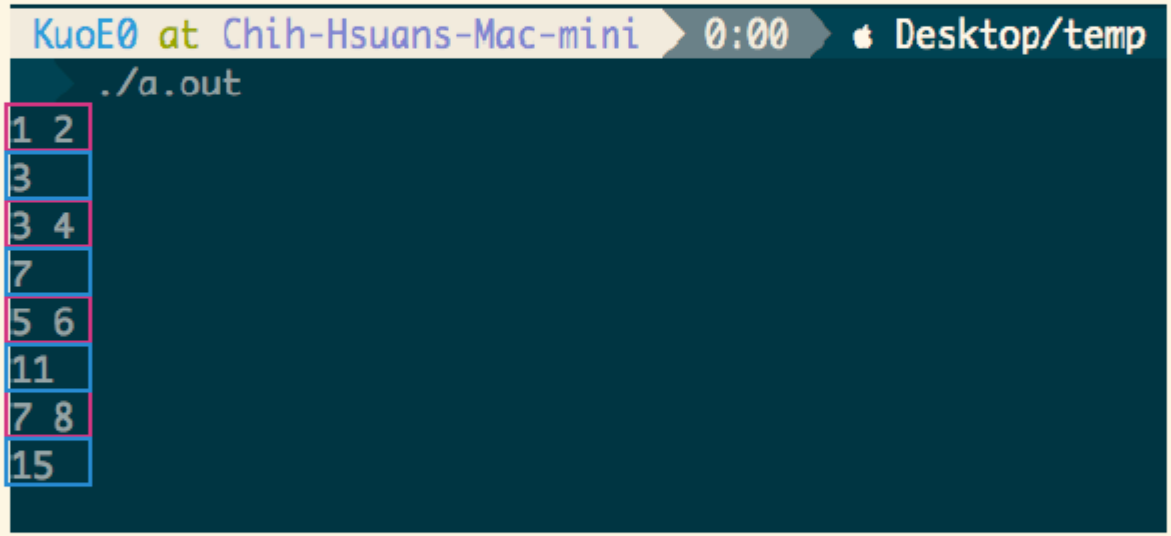
Online Judge introduction

- POJ (PKU Online Judge)

- UVa online judge -> useful tool: uHunt



Standard Input & Output



- 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<=a,b<=10)

Output ← 輸出格式

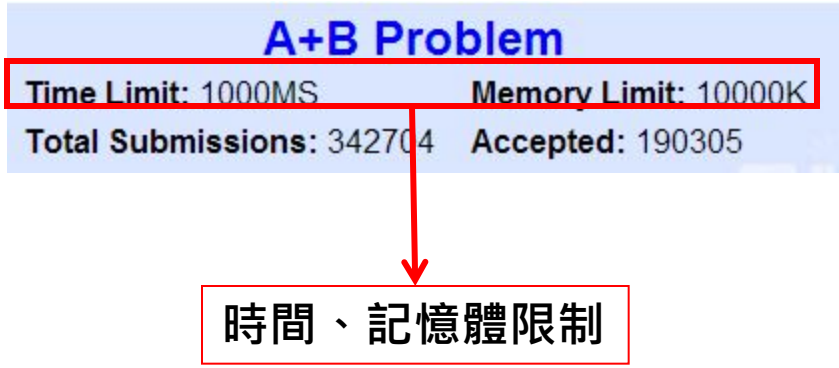
Output a+b

Sample Input ← 輸入範例

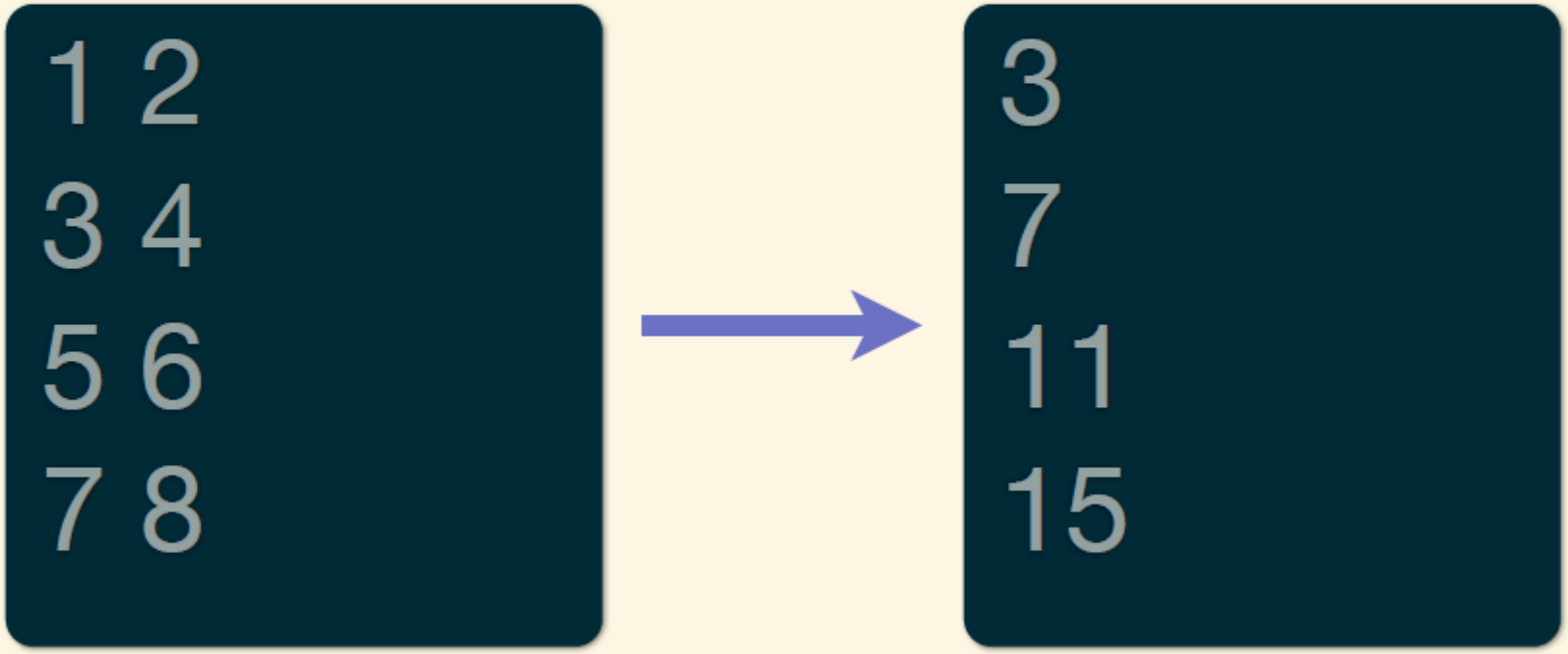
```
1 2
```

Sample Output ← 輸出範例

```
3
```



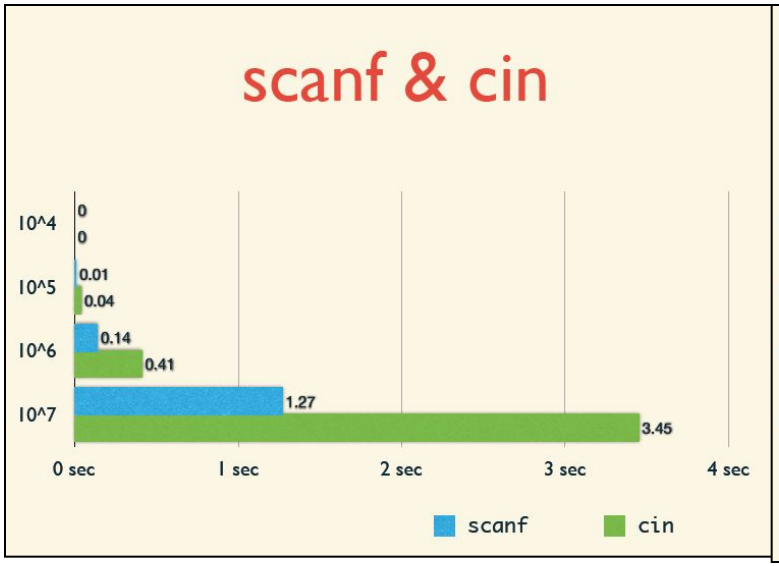
Multiple Test Case

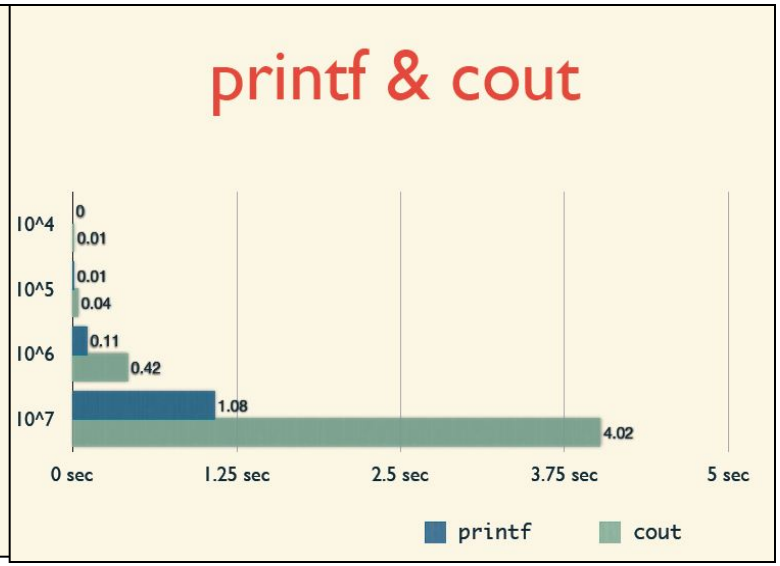


I/O for contest

- 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
  1. 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:

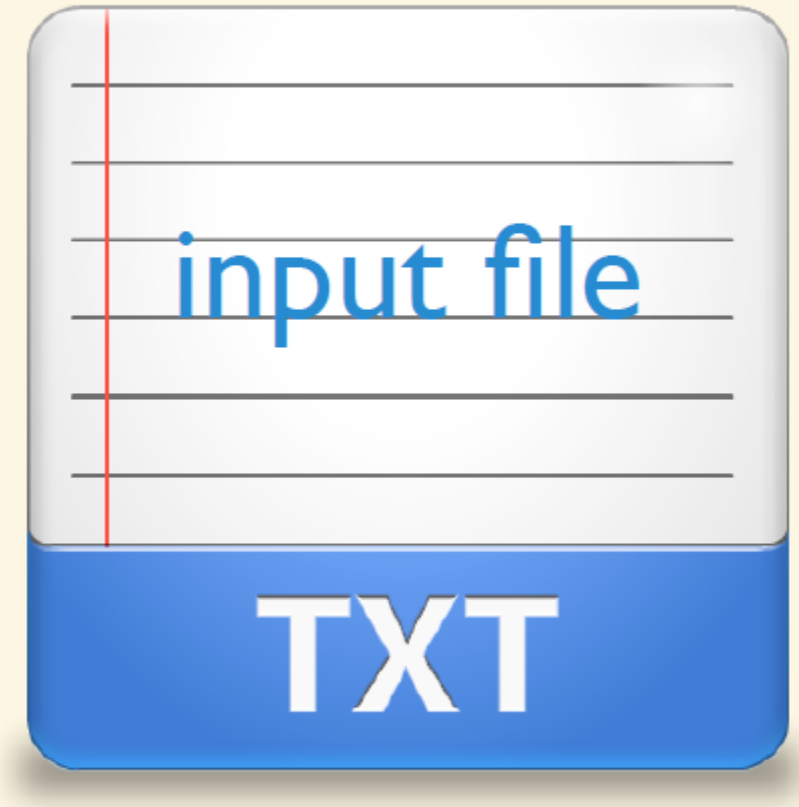
A “corpus” is a collection of texts of written (or spoken) language presented in electronic form.

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 );
}
```


input file
TXT


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(…);
}
…
```

Thank you for your listening!

Practice

- Uva (5)
  100, 579, 10424, 11727, 11984

- POJ (5)
  1000, 1004, 1298, 1450, 2159