計算機概論與程式設計
LAB 6

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Lab 6 : Pointers & Arrays and Strings

- Lab 6-1 : Find Two Largest

- Lab 6-2 : Irreducible fraction

Lab 6-1 : Find Two Largest

Lab 6-1：Find Two Largest

- Write the function according to the provided template
  - This function is void type, can't use return

- Find the largest and second largest values in an array

- **Pointer must be used**

- First input N (# of test_case)
  - N range = [1, 10]

- In each test case
  - Input **10 numbers**
  - Find the largest and second largest

If there are two identical largest numbers, largest and
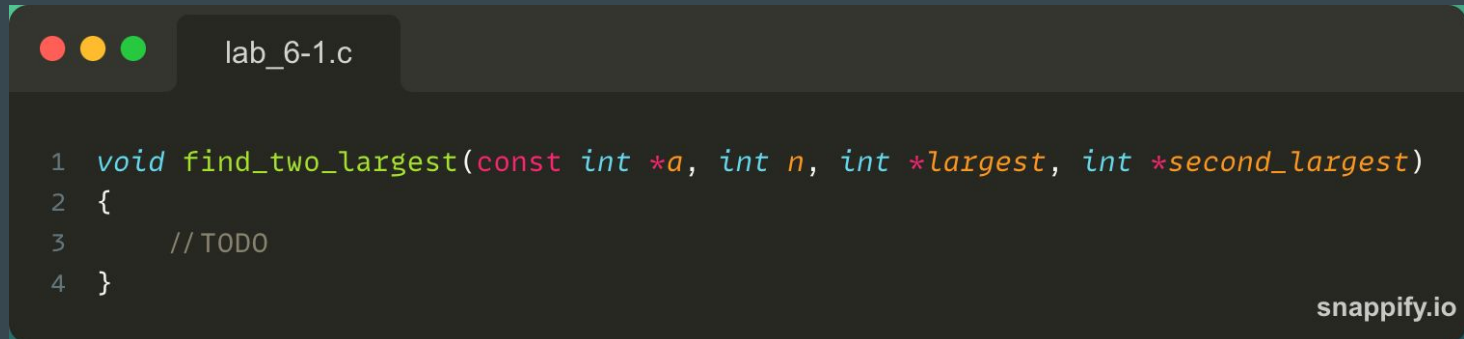second largest values will be same

```
6
Enter 10 numbers: 1 2 3 4 5 6 7 8 9 10
Largest: 10
second_largest: 9
Enter 10 numbers: 987 3 343 51 85 495 783 107 31 76
Largest: 987
second_largest: 783
Enter 10 numbers: -44 -5 0 -82 -31 -43 -94 -65 -727 -123
Largest: 0
second_largest: -5
Enter 10 numbers: 83 -1 213 -836 341 -7 -75 39 42 111
Largest: 341
second_largest: 213
Enter 10 numbers: -1 -4 -3 -56 -1 -5 -17 2 -7 -2
Largest: 2
second_largest: -1
Enter 10 numbers: 19 284 202 345 98 345 31 202 72 284
Largest: 345
second_largest: 345
```

Lab 6-1：Find Two Largest

Requirements

1. The user needs to enter **10 numbers** (including positive and negative)

2. This function needs to **pass the pointer of array**, that is, *const int *a*

3. Save the largest and second largest respectively in the variables pointed to by the pointer

```c
void find_two_largest(const int *a, int n, int *largest, int *second_largest)
{
    // TODO
}
```

lab_6-1.c

snappify.io

Lab 6-2 :
Irreducible fraction (最簡分數)

Lab 6-2：Irreducible fraction

- Write the function according to the provided template
  - This function is void type, can't use return
- Design a program that allows the user to input fraction
- Output will show the irreducible fraction
- Pointer must be used

- First input N (# of test_case)
  - N range = [1, 10]
- In each test case
  - Input **7 fraction**
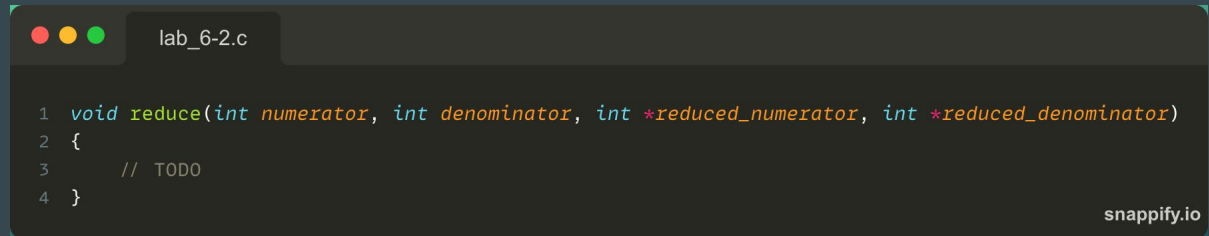 - Reduce to the irreducible fraction

```
7
Enter a fraction: 6/12
Irreducible fraction: 1/2
Enter a fraction: 70/21
Irreducible fraction: 10/3
Enter a fraction: -26/65
Irreducible fraction: -2/5
Enter a fraction: -49/-98
Irreducible fraction: 1/2
Enter a fraction: 19/-95
Irreducible fraction: -1/5
Enter a fraction: 1/3
Irreducible fraction: 1/3
Enter a fraction: 7/0
Error!
```

Lab 6-2：Irreducible fraction

Requirements

- Positive and negative values need to be considered

- Negative sign must be left when output `Irreducible fraction: −1/5`

- If denominator is 0, output will show Error

- **Hint：Calculate GCD of the numerator and denominator, then divide the numerator and denominator by GCD**

1. Reduce function is <u>void type</u>
2. Pass pointer to function

```c
void reduce(int numerator, int denominator, int *reduced_numerator, int *reduced_denominator)
{
    // TODO
}
```

lab_6-2.c

snappify.io

Test Case

- **Please download test case from E3**

```
6
Enter 10 numbers: 1 2 3 4 5 6 7 8 9 10
Largest: 10
second_largest: 9
Enter 10 numbers: 987 3 343 51 85 495 783 107 31 76
Largest: 987
second_largest: 783
Enter 10 numbers: -44 -5 0 -82 -31 -43 -94 -65 -727 -123
Largest: 0
second_largest: -5
Enter 10 numbers: 83 -1 213 -836 341 -7 -75 39 42 111
Largest: 341
second_largest: 213
Enter 10 numbers: -1 -4 -3 -56 -1 -5 -17 2 -7 -2
Largest: 2
second_largest: -1
Enter 10 numbers: 19 284 202 345 98 345 31 202 72 284
Largest: 345
second_largest: 345
```

Lab6-1

```
7
Enter a fraction: 6/12
Irreducible fraction: 1/2
Enter a fraction: 70/21
Irreducible fraction: 10/3
Enter a fraction: -26/65
Irreducible fraction: -2/5
Enter a fraction: -49/-98
Irreducible fraction: 1/2
Enter a fraction: 19/-95
Irreducible fraction: -1/5
Enter a fraction: 1/3
Irreducible fraction: 1/3
Enter a fraction: 7/0
Error!
```

Lab6-2

Grading

- Lab 6-1：Find Two Largest   50% (6*8+2)

- Lab 6-2：Irreducible fraction   50% (7*7+1)

- Total   **100%**

如果只有部分測資答對, 將斟酌給分！

Requirements

- Write **2 program** that can answer 2 questions respectively.

- Upload your code with file name **LAB6_1_<StudentID>.c/.cpp**, **LAB6_2_<StudentID>.c/.cpp** to E3.