Creative Software Programming, Assignment 4-1

Handed out: Sep 29, 2021

Due: 23:59, Sep 29, 2021 **(NO SCORE for late submissions!)**

- *Only files submitted by **git push to this course project at https://hconnect.hanyang.ac.kr** (<Year>_<Course no.>_<Class code>/<Year>_<Course no.>_<Student ID>.git) will be scored.*
- *Place your files under the directory structure **<Assignment name>/<Problem no.>/<your files>** just like the following example.*

```
+ 2020_ITE0000_2019000001
  + 2-1/
    + 1/
      - 1.cpp
      - Makefile
    + 2/
      - 2.cpp
      - Makefile
    + …
```

- *The submission time is determined not when the commit is made **but when the git push is made**.*
- *Your files must be committed to the **master branch**. Otherwise, it will not be scored.*
- *Your program should output correct results even for inputs other than those used in the example.*
- *Basically, assignments are scored based on the output results. If it is not possible to check whether a requirement is implemented because the output is not correct, no score is given for the requirement, even if it is implemented internally. However, even if the output result is correct, no score is given for a requirement if the internal implementation does not satisfy the requirement.*

1. Write a program that works as follows.

A. Take an integer n from the user and create an array of length n. Assume that n > 0.

B. Set the value of each element of the array to 0, 1, … , n-1.

C. Print out the contents of the array.

D. Note that

   i. You must use new [ ] operator to create the array.

   ii. Do not forget to free the memory by using delete[] operator after using the array.

E. Input: An integer value

F. Output: The elements of the array

G. Files to submit:

   i. A C++ source file

   ii. A Makefile to generate the executable

```
$ ./dynamic_array
5⏎
0 1 2 3 4
```

2. Write a program that works as follows.

A. Take an integer N from the user and create an array of length N.

B. Take N integers from the user and fill the array with them.

C. Take an integer from the user as a target value.

D. Find and print out how many target values are in the array.

   i. Print 0 if there is none.

E. Note that

   i. Only <iostream> is allowed to be included.

   ii. DO NOT use STL such as vector (STL will be covered at week 7).

F. Input: An integer value

G. Output: The target value and its count in the array

H. Files to submit:

i. A C++ source file

ii. A Makefile to generate the executable

```
$ ./dynamic_min_max
5⏎
1 2 2 -1 -1⏎
-1⏎
target value: -1
target count: 2
```

3. Write a program that works as follows.

A. Take two integers from the user and store them to two int variables, n1, n2.

B. Take two strings from the user and store them to two std::string variables, s1, s2. Assume these strings do not contain spaces.

C. Implement swap functions for integers and strings in the form of:

i. void swapInt(int& n1, int& n2)

ii. void swapString(std::string& s1, std::string& s2)

D. Swap the value of n1 and n2 and swap the value of s1 and s2 by calling these functions.

E. Print out the values of these four variables before and after calling the swap functions.

F. Input: Two integers, two strings

G. Output: Swapped integers and strings

H. Files to submit:

i. A C++ source file

ii. A Makefile to generate the executable

```
$ ./swaping
2 5 abc def⏎
n1: 2, n2: 5, s1: abc, s2: def
n1: 5, n2: 2, s1: def, s2: abc
```

4. Write a program that works as follows.

A. Take two integers a, b from the user

B. Compute the of (a+b) and (a-b) using the getSumDiff() in the following code skeleton.

C. Print out the results).

D. Note that

   i. The code for printing results must be in main().

E. Input: Two integers a, b

F. Output: a+b, a-b

G. Files to submit:

   i. A C++ source file

   ii. A Makefile to generate the executable

```
$ ./get_sum_diff
1 3
sum:4
diff:-2
```

Code skeleton:

```
#include <iostream>

void getSumDiff(int a, int b, int& sum, int& diff)
{
        // Implement this function
}

Int main(void)
{
       // Implement this function
}
```