창의적 소프트웨어 프로그래밍 Lab 10

Handed out : Thu, Oct 27, 2022

Due : Mon, Oct 31, 2022, 23:59 (NO SCORE for late submissions!)

Submit your file on LMS.

1. Write a program for a sorted number array.
    A. Implement class SortedArray in the code skeleton.
    B. Take an arbitrary number of integers from the user and add them to a SortedArray instance.
    C. Process user commands as described in the Input.
    D. This program should take user input repeatedly
    E. Note that
        i. DO NOT write your own code for sorting and getting min / max. Use STL functions instead.
    F. Input:
        i. First, integer numbers to build a sorted array.
        ii. 'ascend' – Print out the numbers in ascending order.
        iii. 'descend' – Print out the numbers in descending order.
        iv. 'max' – Print out the maximum number among the numbers.
        v. 'min' – Print out the minimum number among the numbers.
        vi. 'quit' – Quit the program.
    G. Output: The result of each command.
    H. Files to submit:
        i. main.cpp – main() must be in this file.
        ii. sorted.h – Just copy the following code skeleton.

iii. sorted.cpp – Implements SortedArray member functions.

iv. A CMakeLists.txt to generate the executable

```
$ ./sorted_array
9 3 6 2 7
ascend
2 3 6 7 9
descend
9 7 6 3 2
max
9
min
2
10 3
ascend
2 3 3 6 7 9 10
quit
$
```

Code skeleton:

```
class SortedArray
{
public:
	void AddNumber(int num);

	 std::vector<int> GetSortedAscending();
	 std::vector<int> GetSortedDescending();
	 int GetMax();
	 int GetMin();

private:
	 std::vector<int> numbers_;
};
```

2. Write a program for an integer set.
    A. Implement class IntegerSet in the code skeleton.
    B. This program should take user input repeatedly
    C. Note that
        i. **DO NOT use std::set<int>**. Use std::vector<int> as shown in the code skeleton.
    D. Input:
        i. 'add' - Add the input number to the set and print out the set. (Do not add if the number already exists in the set.)
        ii. 'del' – Remove the input number from the set and print out the set. (Do nothing if the number is not in the set.)
        iii. 'get' – Print out the element at the input position of the set. (If the input position exceeds the size of the set, print out -1.)
        iv. 'quit' – Quit the program.
    E. Output: The result of each command.
    F. Files to submit:
        i. main.cpp – main() must be in this file.
        ii. intset.h – Just copy the following code skeleton.
        iii. intset.cpp – Implements IntegerSet member functions.
        iv. A CMakeLists.txt to generate the executable

```
$ ./integer_set
add 9
9
add 6
6 9
add 7
6 7 9
add 9
6 7 9
del 6
7 9
del 6
```

```
7 9
get 0
7
get 3
-1
quit
$
```

Code skeleton:

```
class IntegerSet {
        public:
                void AddNumber(int num);
                void DeleteNumber(int num);

                int GetItem(int pos);
        private:
                std::vector<int> numbers_;
}
```