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\underline{\dots} \backslash \mathsf{CECS282}\text{-}\mathsf{Project} \mathsf{6-STL} \backslash \mathsf{CECS277-Lab6-STL} \backslash \mathsf{STL} \_\mathsf{Containers.cpp}
                                                                                   1
 1 #include "STL_Containers.h"
 2 #include <string>
 3 #include <iostream>
 4 #include <stdlib.h>
 5 #include <ctime>
 6 #include <cstdlib>
 7 #include <algorithm>
 8 #include <conio.h>
 9
10
: STL Containers.cpp
12 // Name
13 // Author
                  : Sotheanith Sok
14 // Version : 1.0
15 // Description : This a tester used to test the STL Container by performing
      some function.
17
18 int main() {
19
        std::srand((unsigned)time(0));
20
        std::vector<int>v;
        //Generate 10000 numbers between 1 and 100
21
22
        STL_Containers::generateRandomNumbers(v);
23
24
        //Print numbers in sorted order
25
        STL_Containers::printSortedVector(v);
26
27
        //Print the sum
        std::cout << "\nThe sum of all number: " <<</pre>
28
          STL_Containers::calculateSumOfVector(v) << std::endl;</pre>
29
30
        //Pause the program
31
        std::cout << "\nPress any key to continue..." << std::endl;</pre>
32
        _getch();
33
34
        //Print the average
        std::cout << "\nThe average of all number: " <<</pre>
35
          STL_Containers::calculateAverageOfVector(v) <<"\n"<< std::endl;</pre>
36
37
        //Print the frequency
38
        STL_Containers::printFrequency(v);
        return 0;
39
40 }
41
42 //Precondition:
43 // None.
44 //Postcondition:
```

45 // _Generate 10000 randoms number between 1 and 100 and put it into a vector.

46 void STL_Containers::generateRandomNumbers(std::vector<int>& v) {

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\underline{\dots} \backslash \mathsf{CECS282}\text{-}\mathsf{Project} \mathsf{6-STL} \backslash \mathsf{CECS277-Lab6-STL} \backslash \mathsf{STL\_Containers.cpp}
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47
       for(int i =0;i<10000;++i)</pre>
           v.push_back((std::rand() % 100)+1);
48
49 }
50
51 //Precondition:
52 // _None.
53 //Postcondition:
54 // Print all value in a vector in sorted order.
55 void STL_Containers::printSortedVector(std::vector<int> v)
56 {
57
       std::sort(v.begin(), v.end());
58
       for (std::vector<int>::iterator it = v.begin(); it != v.end(); ++it) {
59
           std::printf("%-4d", *it);
60
       }
61
       std::cout<<""<<std::endl;</pre>
62 }
63
64
65 //Precondition:
66 // _None.
67 //Postcondition:
68 // _Calculate the sum of all values in a vector then return the sum.
69 int STL_Containers::calculateSumOfVector(std::vector<int>& v)
70 {
71
       int total = 0;
72
       for (std::vector<int>::iterator it = v.begin(); it != v.end(); ++it) {
73
           total += *it;
74
75
       return total;
76 }
77
78 //Precondition:
79 // _None.
80 //Postcondition:
81 // __Calculate the average of all values in a vector then return the average.
82 double STL Containers::calculateAverageOfVector(std::vector<int>& v)
83 {
84
       double avg = ((double)calculateSumOfVector(v))/v.size();
85
       return avg;
86 }
87
88 //Precondition:
89 // _None.
90 //Postcondition:
91 // __Print the frequency of all values in a listed order.
92 void STL_Containers::printFrequency(std::vector<int>& v)
93 {
94
       int array[100]{0};
95
       for (std::vector<int>::iterator it = v.begin(); it != v.end(); ++it) {
```

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...\CECS282-Project6-STL\CECS277-Lab6-STL\STL_Containers.cpp
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```
96     array[(*it-1)] += 1;
97     }
98     printf("%-6s%-3s%-8s\n", "Value",":", "Frequency");
99     for (int i = 1; i <= 100;++i) {
100         printf("%-6d%-3s%-8d\n",i,":",array[i-1] );
101     }
102  }
103
104</pre>
```

3