

## main.cpp

```
1 /
   *****
   *****
2  * PROGRAMMER : Ali Eshghi & Amirarsalan Valipour
3  * STUDENT ID : 1112261 / 1103126
4  * CLASS      : CS1B
5  * SECTION    : MW 7:30pm
6  * Lab #5     : Binary Search
7  * DUE DATE   : 24 September 2019
8
   *****
   *****
9  * BINARY SEARCH
10 *
   -----
   -----
11 * In this program we will assign an array and will do the
    following through
12 * different functions: SORTING, BINARY SEARCH, SEQUENTIAL SEARCH,
    OUTPUT
13
   *****
   *****/
14
15 #include "MyHeader.h"
16
17 int main()
18 {
19     /
   *****
   *****
20     * CONSTANTS
21     *
   -----
   -----
22     * OUTPUT - USED FOR CLASS HEADING
23     *
   -----
   -----
24     * PROGRAMMER : Programmer's Name
25     * CLASS      : Student's Course
26     * SECTION    : Class Days and Time
27     * LAB_NUM    : Lab Number (specific to this lab)
28     * LAB_NAME   : Title of the Assignment
29
```

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```
*****
*****/
30
31     const string PROGRAMMER = "Ali Eshghi & Amirarsalan Valipour";
32     const string CLASS      = "CS1B";
33     const string SECTION= "MW: 7:30p - 9:50p";
34     const int    LAB_NUM= 5;
35     const string LAB_NAME= "Finary Search";
36
37     /
*****
*****/
38     * OUTPUT - HEADER
39
*****
*****/
40
41     PrintHeader(PROGRAMMER, CLASS, SECTION, LAB_NUM, LAB_NAME);
42
43     /
*****
*****/
44     * CONSTANTS
45     *
-----
46     * ESSENTIAL CONSTANTS
47     *
-----
48     * AR_SIZE      : Used for the size of array
49
*****
*****/
50
51     const int AR_SIZE = 8;
52
53     /
*****
*****/
54     * VARIABLES
55
*****
*****/
56
```

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```
57     int numAr[AR_SIZE]= {4,1,7,12,8,13,9,21}; // Calc & Out - given
        array
58
59     int i;                // Calc - index for the for loop
60     int seqIndex;         // Calc - index for the sequential
        search
61     int binSearch;        // Calc - index for binary search
62     int searchNum;        // In, Calc & Out - User's choice of
        number
63
64     /
        *****
        *****
65     * OUTPUT ARRAY
66
        *****
        *****/
67
68     ArrayOutput(numAr, AR_SIZE);
69
70     /
        *****
        *****
71     * INPUT / PROCESSING
72
        *****
        *****/
73
74     //FOR loop runs 4 times and asks user to input the number they
        want to
75     //search for
76
77     for(i = 1; i <= 4; i++)
78     {
79         //asks for users number of choice
80
81         cout << "Enter an integer to search for: ";
82         cin >> searchNum;
83
84         //Search for the number through this function
85         seqIndex = ArraySequentialSearch(numAr, AR_SIZE,
        searchNum);
86
87         //OUTPUT
88         if(seqIndex != -1)
```

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```
89     {
90         cout << "The integer " << searchNum
91             << " was found in index #"
92             << seqIndex << "."
93             << endl << endl;
94     } //END - IF
95
96     else
97     {
98         cout << searchNum << " was not found!"
99             << endl << endl;
100     } //END - ELSE
101
102 } //END - FOR
103
104 cout << "Performing Insertion sort" << endl << endl;
105
106 //Sorts Array
107 ArraySort(numAr, AR_SIZE);
108
109 //Outputs Array
110 ArrayOutput(numAr, AR_SIZE);
111
112 //FOR loop runs 4 times and asks user to input the number they
want to
113 //search for
114
115 for(i = 1; i <= 4; i++)
116 {
117     //asks for users number of choice
118     cout << "Enter an integer to search for: ";
119     cin >> searchNum;
120
121     //Search for the number through this function
122     binSearch = ArrayBinarySearch(numAr, AR_SIZE, searchNum);
123
124     //OUTPUT
125     if(binSearch != -1)
126     {
127         cout << "The integer " << searchNum
128             << " was found in index #"
129             << binSearch << "."
130             << endl << endl;
131     } //END - IF
132
```

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```
133         else
134         {
135             cout << searchNum << " was not found!"
136                 << endl << endl;
137         } //END - ELSE
138
139     } //END - FOR
140
141     return 0;
142 }
143
144
145
146
147
```