

```
1 //Ben Scherer
2 // 7/15/2017
3 // SkiersCompetition
4 // Menu based program to display/calculate information about ski competition
  results. Leverages parallel arrays
5
6 //Headers to include
7 #include <iostream> //cout
8 #include <iomanip> // used to manipulate cout
9 #include <string> //needed for string variable
10 #include <math.h> //used for basic arithmetic
11 #include <limits> //user for numeric_limits
12
13
14 using namespace std;
15
16 //Global variables
17 const int SIZE = 5; //Size of parallel arrays
18
19 //function prototypes/overrides
20 void displaySkiers(string skierNames[]); //Displays all names in skier array
21 void displayResults(string skierNames[], double skiTimes[]); //Displays all
  results from competition
22 void displayChoiceMenu(); //Choice menu for program
23 void displayFastest(string names[], double times[]);
24 void displayAverageTime(double skiTimes[]);
25 string getStrInput(string msgToDisplay); //Input validation of strings
26 int getIntInput(); //Input Validation of Int
27 void displaySkiers(string skierNames[]); //Displays all names in skier array
28 void getSkier(string skierNames[], double skiTimes[]); //Prompt user for skier
  name and search array
29 int searchStrArray(string strArray[], string strToSearch, int arrSize); //search
  array for string
30
31
32 int main() {
33     string skierNames[] = { "Leela", "Sarah", "Anna", "Keesha", "Heidi" };
34     double skiTimes[] = { 2.03, 2.40, 1.85, 1.90, 2.50 };
35     int choice;
36
37     do {
38         displayChoiceMenu();
39         choice = getIntInput();
40         switch (choice) {
41             case 1: displayFastest(skierNames, skiTimes);
42                     break;
43             case 2: displayAverageTime( skiTimes);
44                     break;
45             case 3: getSkier(skierNames, skiTimes);
46                     break;
47             case 4: displayResults(skierNames, skiTimes);
48                     break;
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49     }
50
51
52     } while (choice >= 1 && choice <= 4);
53
54 }
55
56 void displayChoiceMenu() {
57     cout << "-----\n"
58         << "Super elite ski competition 2017 \n"
59         << "-----\n"
60         << "1 - Fastest skier in competition \n"
61         << "2 - Average time of field \n"
62         << "3 - Search results \n"
63         << "4 - Display all results\n"
64         << "Please enter a number between 1-4. Select any other number to exit  ➤
        program\n"
65     ;
66
67 }
68
69 void displayResults(string skierNames[], double skiTimes[]) {
70     cout << "Ski Competition Results:\n";
71     for (int i = 0; i < SIZE; i++) {
72         cout << skierNames[i] << "\t" << skiTimes[i] << endl;
73     }
74 }
75
76 //Displays all names in skier array
77 void displaySkiers(string skierNames[]) {
78     cout << "Skiers:\n";
79     for (int i = 0; i < SIZE; i++)
80         cout << "\t" << skierNames[i] << endl;
81 }
82
83
84
85 //Prompt user for skier name and search array
86 void getSkier(string skierNames[], double skiTimes[]) {
87     int skierIndex;
88     displaySkiers(skierNames);
89     string strSkier;
90
91     do {
92
93         strSkier = getStrInput("Enter names of skier\n");
94         skierIndex = searchStrArray(skierNames, strSkier, SIZE);
95         if (skierIndex == -1)
96             cout << "ERROR: Skier not found. Please try again\n";
97     } while (skierIndex == -1);
98
99     cout << skierNames[skierIndex] << "'s time is " << skiTimes[skierIndex]  ➤
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<< endl;

100
101 }
102
103 //Search Array for string
104 int searchStrArray(string strArray[],string strToSearch, int arrSize) {
105     for (int i = 0; i < arrSize; i++) {
106         /*cout << strArray[i] << endl;
107         cout << strToSearch << endl;
108         cout << strcmp(strArray[i].c_str(), strToSearch.c_str()) << endl;
109         */
110         // if (strcmp(strArray[i].c_str(),strToSearch.c_str()) == 0) {
111         if (strArray[i] == strToSearch) {
112             return(i);
113         }
114     }
115     return -1;
116
117 }
118
119 //Finds Fastest skier and displays results
120 void displayFastest(string names[], double times[]) {
121     double highScore = 0.0;
122     int scoreIndex;
123
124     for (int i = 0; i < SIZE;i++) {
125         if (times[i] > highScore) {
126             highScore = times[i];
127             scoreIndex = i;
128         }
129     }
130
131     cout << "The fastest skier is " << names[scoreIndex] << " with a time of " << times[scoreIndex] << "!!!\n";
132
133 }
134
135 //Calculate average time and display results
136 void displayAverageTime(double skiTimes[]) {
137     double sumTime = 0.0;
138     for (int i = 0; i < SIZE;i++) {
139         sumTime += skiTimes[i];
140     }
141     cout << "The average time is " << (sumTime / SIZE) << endl;
142
143 }
144
145 //Validates int input
146 int getIntInput() {
147     int usrInput;
148
149     while (!(cin >> usrInput)) { //Loop until integer in the specified range is
```

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    entered
150     cout << "ERROR: Enter a valid number\n" << endl;
151     cin.clear();
152     cin.ignore(numeric_limits<streamsize>::max(), '\n');
153 }
154 return int(usrInput);
155 }
156
157
158 //Validates string input
159 string getStrInput(string msgToDisplay) {
160     string usrInput;
161     cout << msgToDisplay;
162     while (!(cin >> usrInput)) { //Loop until integer in the specified range is entered
163         cout << "ERROR: Enter a valid string\n" << endl;
164         cin.clear();
165         cin.ignore(numeric_limits<streamsize>::max(), '\n');
166     }
167     return usrInput;
168 }
```