

```
1  /*******
2  //
3  //      Assingment:      #21
4  //
5  //      File:            Homework_project_21.cpp
6  //
7  //      Due Date:        Dec 9 2019
8  //
9  //      Author:          Urban Shocker
10 //
11 //      Course Name:     Programming I
12 //
13 //      Course Number:   COSC 1550
14 //
15 //      Description:     This program
16 //
17 //
18 /*******
19 #include <iostream>
20 #include <string>
21 #include <iomanip>
22 #include <fstream>
23
24 using namespace std;
25
26 const int TESTNUM = 4;
27 const int STUDENTS = 3;
28 //prototype
29
30 void getTests(double[STUDENTS][TESTNUM]);
31 double totalTest(double[STUDENTS][TESTNUM]);
32 double averageTest(double[STUDENTS][TESTNUM]);
33 void averageEachTest(double[STUDENTS][TESTNUM], double[TESTNUM]);
34 void averageEachStudent(double[STUDENTS][TESTNUM], double[STUDENTS]);
35 double getHighest(double[STUDENTS][TESTNUM]);
36 void getHighestOfEachTest(double[STUDENTS][TESTNUM], double[TESTNUM]);
37 void report(double[STUDENTS][TESTNUM]);
38
39 int main()
40 {
41     double tests[STUDENTS][TESTNUM];
42     report(tests);
43 }
44 /*******
45 //reads the file into an array
46 void getTests(double tests[STUDENTS][TESTNUM])
47 {
48     ifstream infile;
49     infile.open("tests.txt");
```

```
50     for (int j = 0; j < STUDENTS; j++)
51     {
52         for (int i = 0; i < TESTNUM; i++)
53         {
54
55             infile >> tests[j][i];
56         }
57     }
58     infile.close();
59 }
60 //*****
61 //gets the total scores for all the tests
62 double totalTest(double tests[STUDENTS][TESTNUM])
63 {
64     double total = 0;
65
66     for (int j = 0; j < STUDENTS; j++)
67     {
68         for (int i = 0; i < TESTNUM; i++)
69         {
70
71             total += tests[j][i];
72         }
73     }
74     return total;
75 }
76 //*****
77 //gets the overall average for tests
78 double averageTest(double tests[STUDENTS][TESTNUM])
79 {
80     double total = 0;
81
82     for (int j = 0; j < STUDENTS; j++)
83     {
84         for (int i = 0; i < TESTNUM; i++)
85         {
86
87             total += tests[j][i];
88         }
89     }
90     return total / (STUDENTS * TESTNUM);
91 }
92 //*****
93 //gets the average per test
94 void averageEachTest(double tests[STUDENTS][TESTNUM], double avgtest[])
95 {
96     double total = 0;
97
98     for (int j = 0; j < TESTNUM; j++)
```

```
99     {
100         total = 0;
101         for (int i = 0; i < STUDENTS; i++)
102         {
103
104             total += tests[i][j];
105         }
106         avgtest[j] = total / STUDENTS;
107     }
108 }
109 //*****
110 //gets the average for each student
111 void averageEachStudent(double tests[STUDENTS][TESTNUM], double avgtest[])
112 {
113     double total = 0;
114
115     for (int j = 0; j < STUDENTS; j++)
116     {
117         total = 0;
118         for (int i = 0; i < TESTNUM; i++)
119         {
120
121             total += tests[j][i];
122         }
123         avgtest[j] = total / TESTNUM;
124     }
125 }
126 //*****
127 //get highest score of all the tests
128 double getHighest(double tests[STUDENTS][TESTNUM])
129 {
130     double highest = tests[0][0];
131     for (int j = 0; j < STUDENTS; j++)
132     {
133         for (int i = 0; i < TESTNUM; i++)
134         {
135             if (tests[j][i] > highest)
136             {
137                 highest = tests[j][i];
138             }
139         }
140     }
141     return highest;
142 }
143 //*****
144 //gets the highest score for each test
145 void getHighestOfEachTest(double tests[STUDENTS][TESTNUM], double highest[])
146 {
147     double highest = 0;
```

```
148
149     for (int j = 0; j < TESTNUM; j++)
150     {
151         highest = 0;
152         for (int i = 0; i < STUDENTS; i++)
153         {
154             if (tests[i][j] > highest)
155             {
156                 highest = tests[i][j];
157             }
158         }
159         hightest[j] = highest;
160     }
161 }
162 //*****
163 // gets the lowest score for each student
164 void getLowestOfEachStudent(double tests[STUDENTS][TESTNUM], double lowtest[])
165 {
166     double lowest = 0;
167
168     for (int j = 0; j < STUDENTS; j++)
169     {
170         lowest = tests[0][0];
171         for (int i = 0; i < TESTNUM; i++)
172         {
173
174             if (tests[j][i] < lowest)
175             {
176                 lowest = tests[j][i];
177             }
178         }
179         lowtest[j] = lowest;
180     }
181 }
182 //*****
183 // reports the results of the math operation to the user.
184 void report(double tests[STUDENTS][TESTNUM])
185 {
186     double avgEachTest[TESTNUM];
187     double avgEachStudent[STUDENTS];
188     double highestTests[TESTNUM];
189     double lowestTests[TESTNUM];
190     getTests(tests);
191     cout << fixed << setprecision(2);
192     cout << "Total for all tests is: " << totalTest(tests) << endl;
193     cout << "Please Enter to Continue";
194     cin.get();
195     cout << "The average for all test is: " << averageTest(tests) << endl;
196     cout << "Please Enter to Continue";
```

```
197     cin.get();
198     averageEachTest(tests, avgEachTest);
199     for (int j = 0; j < TESTNUM; j++)
200     {
201         cout << "Average for test #" << j+1 << ": " << avgEachTest[j] << endl;
202     }
203     cout << "Please Enter to Continue";
204     cin.get();
205     averageEachStudent(tests, avgEachStudent);
206     for (int j = 0; j < STUDENTS; j++)
207     {
208         cout << "Average for Student #" << j + 1 << ": " << avgEachStudent[j] << ↵
209             endl;
210     }
211     cout << "Please Enter to Continue";
212     cin.get();
213     cout << "The highest score is: " << getHighest(tests) << endl;
214     cout << "Please Enter to Continue";
215     cin.get();
216     getHighestOfEachTest(tests, highestTests);
217     for (int j = 0; j < TESTNUM; j++)
218     {
219         cout << "Highest score for test #" << j + 1 << ": " << highestTests[j] << ↵
220             endl;
221     }
222     cout << "Please Enter to Continue";
223     cin.get();
224     getLowestOfEachStudent(tests, lowestTests);
225     for (int j = 0; j < STUDENTS; j++)
226     {
227         cout << "lowest score for student #" << j + 1 << ": " << lowestTests[j] ↵
228             << endl;
229     }
230     cout << "Please Enter to Continue";
231     cin.get();
232 }
233
234
235 /*
236 Total for all tests is: 955.00
237 Please Enter to Continue
238 The average for all test is: 79.58
239 Please Enter to Continue
240 Average for test #1: 78.33
241 Average for test #2: 86.67
242 Average for test #3: 76.67
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```
243 Average for test #4: 76.67
244 Please Enter to Continue
245 Average for Student #1: 78.75
246 Average for Student #2: 78.75
247 Average for Student #3: 81.25
248 Please Enter to Continue
249 The highest score is: 90.00
250 Please Enter to Continue
251 Highest score for test #1: 85.00
252 Highest score for test #2: 90.00
253 Highest score for test #3: 90.00
254 Highest score for test #4: 80.00
255 Please Enter to Continue
256 lowest score for student #1: 70.00
257 lowest score for student #2: 60.00
258 lowest score for student #3: 70.00
259 Please Enter to Continue
260 */
```