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1: // Chaitanya and Shivam
2:
3: #include <iostream>
4: #include <fstream>
5: #include <string>
6: #include <cmath>
7:
8: using namespace std;
9:
10: int main() {
11:
12:     ifstream fin("command_data.txt");
13:     if (!fin)
14:     {
15:         cout << "Error! could not open the file: command_data.txt";
16:         return 1;
17:     }
18:
19:
20:     int totalCommands = 0;
21:     int interestingCount = 0;
22:     int unauthorizedCount = 0;
23:     int gppCount = 0;
24:     int makeCount = 0;
25:
26:
27:     int cmdID;
28:     string username;
29:     long timeStamp;
30:     string commandType;
31:     int N;
32:
33:
34:     while (fin >> cmdID >> username >> timeStamp >> commandType >> N)
35:     {
36:         totalCommands++;
37:
38:         bool hasStd = false;
39:         bool correctOutput = true;
40:
41:         //Reading N components:
42:         for(int i = 0; i < N; i++)
43:         {

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44:         string component;
45:
46:         fin >> component;
47:
48:         if (commandType == "g++")
49:         {
50:             if (component == "-std=c++17")
51:             {
52:                 hasStd = true;
53:             }
54:
55:             if (component == "-o")
56:             {
57:                 string nextComp;
58:
59:                 if (i + 1 < N)
60:                 {
61:                     fin >> nextComp;
62:                     i++;
63:
64:                     if (nextComp != "a.out")
65:                     {
66:                         correctOutput = false;
67:                     }
68:                 }
69:
70:                 else
71:                 {
72:                     correctOutput = false;
73:                 }
74:             }
75:         }
76:     }
77:
78:
79:     //Interesting Commands:
80:     if (commandType == "make" || commandType == "g++" ||
commandType == "valgrind" || commandType == "tar" || commandType ==
"./a.out")
81:     {
82:         interestingCount++;
83:     }
84:

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85:      //Unauthorized Commands:
86:      if (commandType == "sudo")
87:      {
88:          unauthorizedCount++;
89:      }
90:
91:      //Compilation Commands:
92:      if (commandType == "make")
93:      {
94:          makeCount++;
95:      }
96:
97:      if (commandType == "g++")
98:      {
99:          gppCount++;
100:
101:          bool invalidStd = !hasStd;
102:          bool invalidOut = !correctOutput;
103:
104:          if (invalidStd || invalidOut)
105:          {
106:              cout << "Command " << cmdID << " is invalid: ";
107:
108:              if (invalidStd && invalidOut)
109:              {
110:                  cout << "both errors" << endl;
111:              }
112:
113:              else if (invalidStd)
114:              {
115:                  cout << "wrong or missing standard" << endl;
116:              }
117:
118:              else
119:              {
120:                  cout << "wrong output file" << endl;
121:              }
122:          }
123:      }
124:  }
125:
126:  fin.close();
127:

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128:     //Calculations:
129:     double unauthorizedPer = (100.0 * unauthorizedCount) /
totalCommands;
130:
131:     double gppPer = (100.0 * gppCount) / (gppCount + makeCount);
132:
133:     //Output:
134:     cout << endl << "Total number of interesting commands: " <<
interestingCount << endl;
135:     cout << "Percentage of unauthorized commands: " <<
unauthorizedPer << "%" << endl;
136:     cout << "Percentage of g++ compilation commands: " << gppPer <<
"%" << endl;
137:
138:     return 0;
139: }
140:
141: /*
142:
143: OUTPUT:
144:
145: Command 63438 is invalid: wrong or missing standard
146: Command 63445 is invalid: wrong or missing standard
147: Command 63447 is invalid: wrong or missing standard
148: Command 63449 is invalid: wrong or missing standard
149: Command 63451 is invalid: wrong or missing standard
150: Command 63453 is invalid: wrong or missing standard
151: Command 63455 is invalid: wrong or missing standard
152: Command 63457 is invalid: wrong or missing standard
153: Command 63459 is invalid: wrong or missing standard
154: Command 63477 is invalid: wrong or missing standard
155: Command 63865 is invalid: both errors
156: Command 64232 is invalid: wrong output file
157: Command 64233 is invalid: wrong output file
158: Command 64246 is invalid: wrong output file
159: Command 64261 is invalid: wrong output file
160: Command 64263 is invalid: wrong output file
161: Command 64265 is invalid: wrong output file
162: Command 64267 is invalid: wrong output file
163: Command 64298 is invalid: wrong output file
164:
165: Total number of interesting commands: 535
166: Percentage of unauthorized commands: 0.9%

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167: *Percentage of g++ compilation commands: 11.5556%*
168:
169: -----
170: *Process exited after 4.302 seconds with return value 0*
171: *Press any key to continue . . .*
172:
173: */
174: