lab10

```
$ gcc lab10.c
$ ./a.out < ../lab10.dat
Grand Prize:
  1: Ava BROWN 285.2
  2: John PRICE 284.9
  3: Isaac WASHINGTON 276.4
  4: Leah YOUNG 267.3
  5: Samuel BENNETT 264.5
  6: Alexis JACKSON 261.8
Math Prize:
  1: Gabriella HILL 99.3
  2: Elizabeth ANDERSON 98.9
  3: Abigail WILSON 98.3
  4: Benjamin RAMIREZ 97.4
  5: Isaiah BUTLER 97.4
  6: Daniel MORGAN 97.1
  7: Alexa PEREZ 96.8
  8: Alexander ROGERS 95.8
  9: Anna HERNANDEZ 95.4
 10: Christian BROOKS 95.3
Science Prize:
  1: James PETERSON 98.7
  2: Isaiah BUTLER 98.3
  3: Abigail WILSON 98.1
  4: Carter HAYES 96.6
  5: Dylan BARNES 96.3
  6: Noah MURPHY 95.5
  7: Avery LOPEZ 94.0
  8: Sydney EVANS 93.1
  9: Caleb HENDERSON 93.0
 10: Nicholas COLEMAN 91.7
Literature Prize:
  1: Elijah JAMES 99.7
  2: Jack SIMMONS 99.6
  3: Michael MORRIS 99.4
  4: Natalie MARTIN 98.9
  5: Nevaeh SCOTT 98.4
  6: Alyssa MARTINEZ 97.8
  7: James PETERSON 95.9
  8: Logan TORRES 95.7
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  9: Audrey EDWARDS 95.5
 10: Alexa PEREZ 93.2

CPU time: 0.0058526 sec
score: 86
o. [Format] Program format can be improved
o. [Coding] lab10.c spelling errors: informaition(1)
o. [Sorting] is not needed.
```

lab10.c

```c
// EE2310 lab10 Academic Competition
// 109061217, 林峻霆
// Date: 2020/12/7

#include <stdio.h>
#include <stdlib.h>

struct STU {                            // struct store student informaition
    char fname[15];                     // student's first name
    char lname[15];                     // student's last name
    double math, sci, lit;              // score of subject
    double min;                         // lowest score
    double total_score;                 // total score
    int winGra;                         // qualify for Grand Prize
    int winSub;                         // qualify for Subject Prize
};

struct STU list[100];                   // a list to store every students

int main(void)
{
    int i, j;                           // parameter for loop and index
    int total = 0;                      // total amount of prize
    char tmp[20];                       // tmp to store input string
    struct STU swp;                     // swp for swapping two struct

    for (i = 0; i < 5; i++)             // filter non-important input
        scanf("%s", tmp);

    for (i = 0; i < 100; i++) {         // input every students' information
        scanf("%s", list[i].fname);
        scanf("%s", list[i].lname);
        scanf("%s", tmp);
        list[i].math = atof(tmp);
        scanf("%s", tmp);
        list[i].sci = atof(tmp);
        scanf("%s", tmp);
        list[i].lit = atof(tmp);
        list[i].total_score = list[i].math + list[i].sci + list[i].lit;

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```
41          list[i].min = list[i].math;      // find the lowest-score subject
42          if (list[i].min > list[i].sci) {
43              list[i].min = list[i].sci;
44              if (list[i].min > list[i].lit)
45                  list[i].min = list[i].lit;
46          }
47          else if (list[i].min > list[i].lit)
48              list[i].min = list[i].lit;
49
50          if (list[i].min >= 82)          // check the qualification
51              list[i].winGra = 1;
52          else
53              list[i].winGra = 0;
54
55          if (list[i].min >= 60)
56              list[i].winSub = 1;
57          else
58              list[i].winSub = 0;
59      }
60
61      printf("Grand Prize:\n");          // print the first line
62      for (i = 0; i < 100; i++) {        // put top ten to front
63          if (list[i].winGra) {
64              for (j = i + 1; j < 100; j++) {
65                  if(list[j].winGra && list[j].total_score > list[i].total_score)
                    if (list[j].winGra && list[j].total_score > list[i].total_score)
66                  {
67                      swp = list[j];
68                      list[j] = list[i];
69                      list[i] = swp;
70                  }
71              }
72          }
73      }
74                                         // print the name list of Grand Prize
75      for(i = 0; i < 100 && total < 10; i++) {
        for (i = 0; i < 100 && total < 10; i++) {
76          if(list[i].winGra) {
            if (list[i].winGra) {
77              total += 1;
78              printf("%3d: %s %s ", total, list[i].fname, list[i].lname);
```

```
79              printf("%.1lf\n", list[i].total_score);
80          }
81      }
82
83      total = 0;                          // set amount of prize to 0
84      printf("Math Prize:\n");            // print the first line
85      for (i = 0; i < 100; i++) {         // put top ten to front
86          if (!list[i].winGra  && list[i].winSub) {
87              for (j = i + 1; j < 100; j++) {
88                  if (list[j].winSub && list[j].math > list[i].math) {
89                      swp = list[j];
90                      list[j] = list[i];
91                      list[i] = swp;
92                  }
93              }
94          }
95      }
96                                          // print the name list of Math Prize
97      for (i = 0; i < 100 && total < 10; i++) {
98          if (!list[i].winGra && list[i].winSub) {
99              total += 1;
100             printf("%3d: %s %s ", total, list[i].fname, list[i].lname);
101             printf("%.1lf\n", list[i].math);
102         }
103     }
104
105     total = 0;                          // reset the amount of prize
106     printf("Science Prize:\n");         // print the first line
107     for (i = 0; i < 100; i++) {         // put top ten to front
108         if (!list[i].winGra && list[i].winSub) {
109             for (j = i + 1; j < 100; j++) {
110                 if (list[j].winSub && list[j].sci > list[i].sci) {
111                     swp = list[j];
112                     list[j] = list[i];
113                     list[i] = swp;
114                 }
115             }
116         }
117     }
118                                         // print name list of Science Prize
119     for (i = 0; i < 100 && total < 10; i++) {
```

```
120         if (!list[i].winGra && list[i].winSub) {
121             total += 1;
122             printf("%3d: %s %s ", total, list[i].fname, list[i].lname);
123             printf("%.1lf\n", list[i].sci);
124         }
125     }
126 
127     total = 0;                          // reset the amount of prize
128     printf("Literature Prize:\n");      // print the first line
129     for (i = 0; i < 100; i++) {         // put top ten to front
130         if (!list[i].winGra && list[i].winSub) {
131             for (j = i + 1; j < 100; j++) {
132                 if (list[j].winSub && list[j].lit > list[i].lit) {
133                     swp = list[j];
134                     list[j] = list[i];
135                     list[i] = swp;
136                 }
137             }
138         }
139     }
140                                         // print name list of Literature Prize
141     for (i = 0; i < 100 && total < 10; i++) {
142         if (!list[i].winGra && list[i].winSub) {
143             total += 1;
144             printf("%3d: %s %s ", total, list[i].fname, list[i].lname);
145             printf("%.1lf\n", list[i].lit);
146         }
147     }
148 
149     return 0;                           // end the program
150 }
```