

```
1 //
2 // Created by hfwei on 2022/12/8.
3 //
4
5 #include <stdio.h>
6 #include <stdalign.h>
7 #include <string.h>
8 #include <stdlib.h>
9
10 typedef enum gender {
11     MALE, FEMALE,
12 } Gender;
13
14 typedef struct score {
15     int c_score;
16     int java_score;
17     int python_score;
18 } Score;
19
20 typedef struct musician {
21     char *name;
22     Gender gender;
23     char *album;
24     Score scores;
25 } Musician;
26
27 void PrintMusician(const Musician *musician);
28 int CompareMusicians(const void *m1, const void *m2);
29
30 int main() {
31     Musician luo = {
32         "Luo Dayou",
33         MALE,
34         "ZhiHuZheYe",
35         20,
36         30,
37         40,
38     };
39     printf("sizeof luo : %zu\n", sizeof luo);
40     printf("alignof Musician : %zu\n", alignof(Musician));
41     printf("sizeof members in Musician : %zu\n",
42         2 * sizeof(char *) + sizeof(char) + 3 * sizeof(int));
43
44     Musician cui = {
45         .name = "Cui Jian",
46         .gender = MALE,
47         .album = "XinChangZhengLuShangDeYaoGun",
48         .scores = {20, 30, 40},
49     };
50
51     char album[] = "YiKeBuKenMeiSuDeXin";
52     Musician zhang = {
53         .name = "Zhang Chu",
```

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54     .gender = MALE,
55     .album = album,
56     .scores = {
57         .c_score = 20,
58         .java_score = 30,
59         .python_score = 40,
60     },
61 };
62 // PrintMusician(&zhang);
63
64 // Musician guo = zhang;
65 // guo.name = "guo";
66 // strcpy(guo.album, "YiKeMeiSuDeXin");
67 // PrintMusician(&guo);
68 // PrintMusician(&zhang);
69
70 Musician musicians[] = {luo, cui, zhang};
71 int len = sizeof musicians / sizeof *musicians;
72 for (int i = 0; i < len; i++) {
73     PrintMusician(musicians + i);
74 }
75
76 qsort(musicians, len,
77       sizeof *musicians, CompareMusicians);
78 for (int i = 0; i < len; i++) {
79     PrintMusician(musicians + i);
80 }
81
82 return 0;
83 }
84
85 void PrintMusician(const Musician *musician) {
86     printf("\n%s\t%c\t%s\t%d\t%d\t%d\t\n",
87           musician->name,
88           musician->gender == MALE ? 'M' : 'F',
89           musician->album,
90           musician->scores.c_score,
91           musician->scores.java_score,
92           musician->scores.python_score);
93 }
94
95 int CompareMusicians(const void *m1, const void *m2) {
96     return strcmp(((const Musician *) m1)->album,
97                  ((const Musician *) m2)->album);
98 }

```