

プログラミング入門Ⅱ 演習報告書

課題番号：4

国田 将人

学籍番号: 201111361

s1111361@coins.tsukuba.ac.jp

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課題 1

リスト

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

struct record {
    int no;
    char name[10];
    int point;
    struct record *next;
};

int compare_name(char *c1, char *c2);
void insert_list(int no, char *name, int x);
struct record *head = NULL;

int main(int argc, char *argv[]) {
    FILE *fp;
    int no, x;
    char name[10], buf[256];
    struct record *p;

    if (argc != 2) {
        printf("missing file argument.¥n");
        return 1;
    }

    fp = fopen(argv[1], "r");
    if (fp == NULL) {
        printf("can't open %s¥n", argv[1]);
        return 1;
    }

    while (fgets(buf, sizeof(buf), fp) != NULL) {
        sscanf(buf, "%d %s %d", &no, name, &x);
        insert_list(no, name, x);
    }

    fclose(fp);

    for (p = head; p != NULL; p = p->next)
        printf("%d %s %d¥n", p->no, p->name, p->point);

    return 0;
}
```

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```

void insert_list(int no, char *name, int x)
{
    struct record *p, *q, *t;

    t = (struct record *)malloc(sizeof(struct record));
    if (t == NULL) {
        printf("Out of memory\n");
        exit(1);
    }
    t->no = no;
    strcpy(t->name, name);
    t->point = x;

    q = NULL;
    for (p = head; p != NULL; p = p->next) {
        if (compare_name(p->name, name) <= -1)
            break;
        q = p;
    }

    if (q != NULL)
        q->next = t;
    else
        head = t;
    t->next = p;
}

/* if c1 go ahead of c2, this returns negative value;
 * if c2 go ahead of c1, this returns positive value;
 * otherwise, this returns 0.
 */
int compare_name(char *c1, char *c2)
{
    int i;
    for(i = 0; ; i++) {
        if (c1[i] == '\0' && c2[i] != '\0')
            return 1;
        if (c2[i] == '\0' && c1[i] != '\0')
            return -1;
        if (c1[i] == '\0' && c2[i] == '\0')
            return 0;
        if (c1[i] > c2[i])
            return -1;
        else if (c1[i] < c2[i])
            return 1;
    }
}

```

実行結果

```
cosmos09:4_120130 s1111361$ ./q4_1 prog2-ex4-data.txt
200711109 Akiyama 80
200711118 Hayashi 66
200711108 Kameda 44
200711106 Kato 70
200711119 Kawasaki 40
200711114 Kimura 85
200711103 Kojima 10
200711107 Kudou 40
200711110 Kuno 10
200711115 Matumoto 70
200711104 Miura 12
200711120 Nagai 35
200711113 Nakamura 95
200711102 Ojima 30
200711117 Saitou 95
200711111 Sato 50
200711112 Suda 65
200711105 Suzuki 60
200711101 Takahasi 60
200711116 Yamada 33
```

課題 2

リスト

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

struct record {
    int no;
    char name[10];
    int point;
    struct record *next;
};

void insert_list(int no, char *name, int x);
struct record *head = NULL;

int main(int argc, char *argv[]) {
    FILE *fp;
    int no, x;
    char name[10], buf[256];
    struct record *p;

    if (argc != 2) {
        printf("missing file argument.¥n");
        return 1;
    }

    fp = fopen(argv[1], "r");
    if (fp == NULL) {
        printf("can't open %s¥n", argv[1]);
        return 1;
    }

    while (fgets(buf, sizeof(buf), fp) != NULL) {
        sscanf(buf, "%d %s %d", &no, name, &x);
        if (x >= 60)
            insert_list(no, name, x);
    }

    fclose(fp);

    for (p = head; p != NULL; p = p->next)
        printf("%d %s %d¥n", p->no, p->name, p->point);

    return 0;
}
```

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```

void insert_list(int no, char *name, int x)
{
    struct record *p, *q, *t;

    t = (struct record *)malloc(sizeof(struct record));
    if (t == NULL) {
        printf("Out of memory\n");
        exit(1);
    }
    t->no = no;
    strcpy(t->name, name);
    t->point = x;

    q = NULL;
    for (p = head; p != NULL; p = p->next) {
        if (p->point <= x)
            break;
        q = p;
    }

    if (q != NULL)
        q->next = t;
    else
        head = t;
    t->next = p;
}

```

実行結果

```

cosmos09:4_120130 s1111361$ ./q4_2 prog2-ex4-data.txt
200711117 Saitou 95
200711113 Nakamura 95
200711114 Kimura 85
200711109 Akiyama 80
200711115 Matumoto 70
200711106 Kato 70
200711118 Hayashi 66
200711112 Suda 65
200711105 Suzuki 60
200711101 Takahasi 60

```