

// 「Cで学ぶデータ構造とアルゴリズム」(西原清一) オーム社, 2008

// 図2・8 (p.30-31) 連鎖リストへのデータの整列挿入(頭なし)

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

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

```
struct list
```

```
{    int age;
```

```
    struct list *next;
```

```
};
```

```
struct list *get_cell()
```

```
{    struct list *p;
```

```
    if ((p = (struct list *) malloc(sizeof(struct list))) == NULL) {
```

```
        printf("malloc error\n");
```

```
        exit(EXIT_FAILURE);
```

```
    }
```

```
    return p;
```

```
}
```

```
struct list *add_list(int years, struct list *head) /* リストにセルを登録 */
```

```
{    struct list *p, *a, *b;
```

```
    p = get_cell();
```

```
    p->age = years;
```

```
    if (head == NULL) {
```

```
        p->next = NULL;
```

```
        return p;
```

```
    }
```

```
    if (years <= head->age) {
```

```
        p->next = head;
```

```
        head = p;
```

```
        return head;
```

```
    }
```

```
    a = head;
```

```
    b = a->next;
```

```
    for (;;) {
```

```
        if (b == NULL || years <= b->age) {
```

```
            a->next = p;
```

```
            p->next = b;
```

```
            break;
```

```

        } else {
            a = b;
            b = a->next;
        }
    }
    return head;
}

int main(void)
{
    struct list *head=NULL, *p;
    int age = 0;
    printf("Input age data (use negative age to quit):¥n");
    while (age >= 0) {
        printf("> ");
        scanf("%d", &age);
        if (age >= 0) {
            head = add_list(age, head); /* リストにデータを登録 */
        }
    }
    p = head;
    printf("¥nThe final list is:¥n    ("); /* 最終リストの表示 */
    while (p != NULL) { /* 次ポインタが NULL になるまで表示 */
        printf(" %d ", p->age);
        p = p->next;
    }
    printf(")¥n¥n");
    return 0;
}

```