评阅人	

实验成绩	

中南大學

自动化学院本科生实验报告

_____课 程 实 验 报 告

专业_____班级_____姓名_____学号_____

预定时间 星期_____节次_____ 实际实验时间 星期_____节次_____

地点_____台号_____授课教师_____指导教师_____

实验名称_____

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
int FindChar(const char* str, char xCh, int** positions);
int FindString(const char* str, const char* target, int** positions);
int main()
{
    char sign;
    do
    {   char str[100];
        char input[100];
        char xCh;
        int* position;
        int count;
        int choice;
        printf("input a char(1) or a string(2) : ");
        scanf_s("%d", &choice);
        while (getchar() != '\n');
        printf("input a string:");
        fgets(str, sizeof(str), stdin);
        int len = strlen(str);
        if (choice == 1)
        {
            printf("input a character: ");
            scanf_s(" %c", &xCh);
            count = FindChar(str, xCh, &position);
            if (count == 0){
                printf("'%c' not found.\n", xCh);
            }
            else{
                printf("'%c' found %d times at positions: ", xCh, count);
                for (int i = 0; i < count; i++){
                    printf("%d ", position[i]);
                }
                printf("\n");
            }
        } else {
            printf("input a string to find: ");
            fgets(input, sizeof(input), stdin);
            len = strlen(input);
            if (len > 0 && input[len - 1] == '\n'){
                input[len - 1] = '\0';
            }
            count = FindString(str, input, &position);
            if (count == 0){
                printf("'%s' not found.\n", input);
            }
            else{
                printf("'%s' found %d times at positions: ", input, count);
                for (int i = 0; i < count; i++){
                    printf("%d ", position[i]);
                }
                printf("\n");
            }
        }
        free(position);
        printf("Y/N input again ?");
        scanf_s(" %c", &sign);
        while (getchar() != '\n');
    }   while (sign == 'Y' );
    printf("over!");
    return 0;
}
int FindChar(const char* str, char xCh, int** positions)
{
    int count = 0;
    int len = strlen(str);
    int* position = (int*)malloc(len * sizeof(int));
    for (int i = 0; i < len; i++){
        if (str[i] == xCh){
            position[count] = i;
            count++;
        }
    }
    *positions = position;
    return count;
}
int FindString(const char* str, const char* target,
 int** positions)
{
    int count = 0;
    int str_len = strlen(str);
    int target_len = strlen(target);
    int* position = (int*)malloc(str_len * sizeof(int));
    for (int i = 0; i <= str_len; i++){
        int found = 1;
        for (int j = 0; j < target_len; j++){
            if (str[i + j] != target[j]){
                found = 0;
                break;
            }
        }
        if (found){
            position[count] = i;
            count++;
        }
    }
    *positions = position;
    return count;
}
```

```c
#include <stdio.h>
#include <stdlib.h>
struct student{
    long num;
    char name[20];
    char sex;
    int age;
    float score;
};
int main(){
    int n,male_count = 0, female_count = 0;
    struct student* students;
    float total_score = 0, average_score = 0;
    do{
        printf("number of students(2<=n<=4): ");
        scanf_s("%d", &n);
        if (n < 2 || n > 4)
        {
            printf("Error\n");
        }
    } while (n < 2 || n > 4);
    students = (struct student*)malloc(n * sizeof(struct student));
    if (students == NULL){
        printf("Error!\n");
        return 1;
    }
    for (int i = 0; i < n; i++){
        printf("input student:\n");
        printf("\nstudent %d\n", i + 1);
        printf("num: ");
        scanf_s("%ld", &students[i].num);
        printf("name: ");
        scanf_s("%s", students[i].name, (unsigned)sizeof(students[i].name));
        printf("sex (M/F)/(m/f): ");
        scanf_s(" %c", &students[i].sex);
        printf("age: ");
        scanf_s("%d", &students[i].age);
        printf("score: ");
        scanf_s("%f", &students[i].score);
    }
    for (int i = 0; i < n; i++){
        if (students[i].sex == 'M' || students[i].sex == 'm'){
            male_count++;
        }
        else if (students[i].sex == 'F' || students[i].sex == 'f'){
            female_count++;
        }
    }
    for (int i = 0; i < n; i++){
        total_score += students[i].score;
    }
        average_score = total_score / n;
        printf("\nStudents'Information:\n");
        for (int i = 0; i < n; i++){
            printf("student[%d]:
                  num:%ld,name:%s,sex:%c,age:%d,score:%f\n", i + 1, students[i].num,
                    students[i].name, students[i].sex, students[i].age, students[i].score);}
        printf("\n\n");
        printf("Number of male is %d;\n", male_count);
        printf("Number of female is %d;\n", female_count);
        printf("Average score is %f\n", average_score);
        printf("Students below averrage score:\n");
        for (int i = 0; i < n; i++){
            if (students[i].score < average_score){
                printf("Num:%ld   Name:%s   Sex:%c   Age:%d   Score:%f\n",
         students[i].num, students[i].name, students[i].sex, students[i].age, students[i].score);}
        }
```