Student Management System

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Introduction

Student management system is designed for educators, students or others who are required to collate personnel information and organize them according to certain requirements. With the help of SMS (Student management system), staff can achieve the goal of saving time and improve work efficiency. For optimizing system, several methods are used, including storing data in disk instead of stack, freeing memory of stack in time, code encapsulation and reuse, program error or success reporting mechanism and adding intelligent evaluation functions. A software, named visual Studio 2019, is enough to run SMS to make person's life more convenient.

Methodology

Optimization of storage structure: using structure and storing data in disk

The structure named student is be created for store the data. It includes student's name, ID number, gender, age and three courses' grades which are math, English and computer. These three courses' grades are integer type, while others are character array variables. Therefore, character array variables can optionally store any kinds of characters. After adding one personal information, SMS opens a text file and stores the data in disk in time. Meanwhile, it empties stack, which is benefit for the situation where countless data must be stored at the same time. In addition, compared to class, structure has the advantage that data access stored on the stack is relatively efficient.

Code optimization: code encapsulation and reuse

Encapsulating functions out of a class enables code fully reusable. For example, the function char* browseFil(fstream& Sfile),which had be called for 6 times .The

function prototype as follow:

```
53    char str[20];
54   char* browseFil(fstream& Sfile)
55    {
56        if (Sfile)Sfile.getline(str, 20);
57        return str;
58    }
```

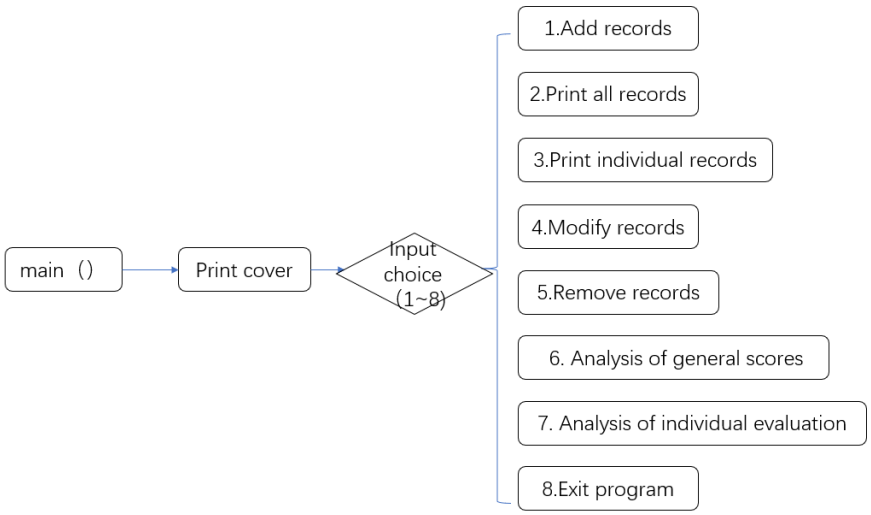
Security: program error or success reporting mechanism

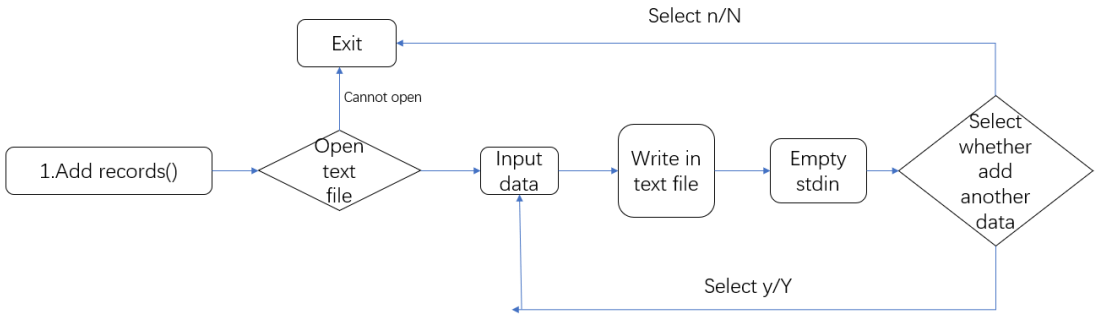
When testing program, problems have arisen. For instance, the text file cannot open successfully so that the data cannot be read, written or modified and pointer conflict occurred during access. Usually, debugging command line one by one can find the issue. By debugging, the command line which has the problem of pointer conflict occurred during access can be informed. Modify as appropriate can avoid the error. To settle the matter of user cannot to know whether the text file open successfully and avoid information errors, some hints are printed in command window to reminder users or the system will be forced out if necessary.

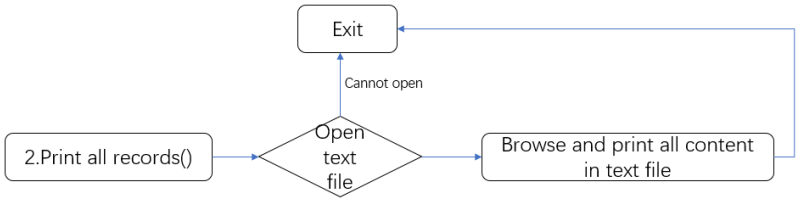
Functional diversity: adding intelligent evaluation functions

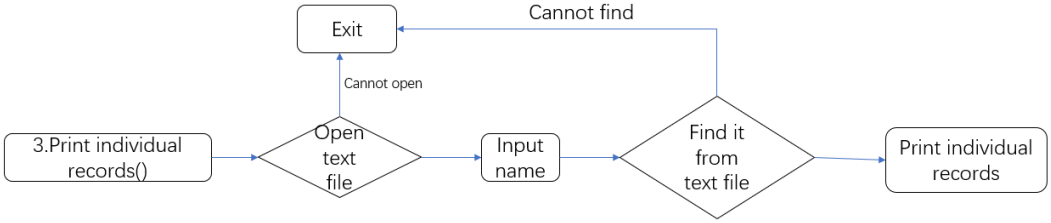
In addition to the basic functions, two intelligent evaluation functions are involved to provide data analysis.

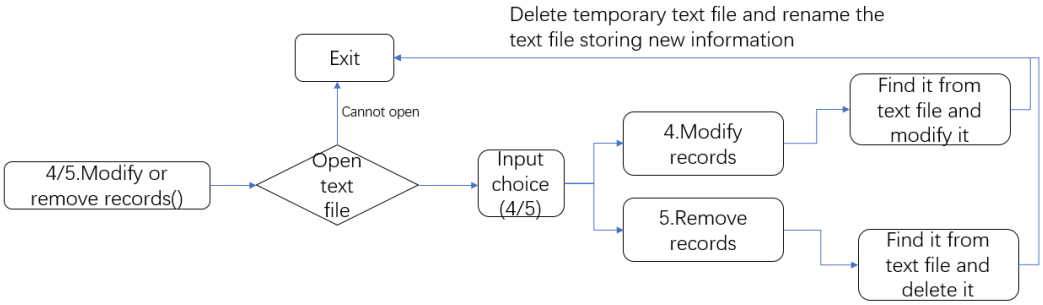
Flow charts of function implementation as follow:

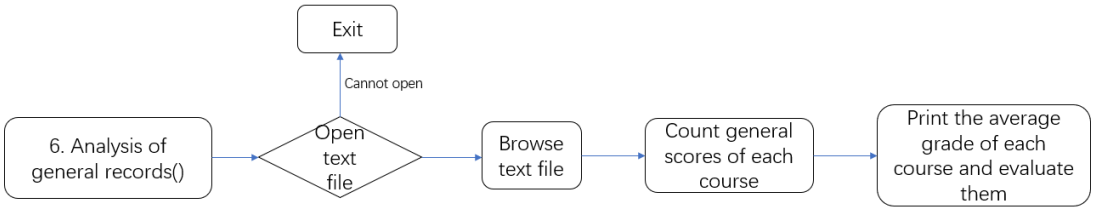

main ()
Print cover
Input choice (1~8)
1.Add records
2.Print all records
3.Print individual records
4.Modify records
5.Remove records
6. Analysis of general scores
7. Analysis of individual evaluation
8.Exit program

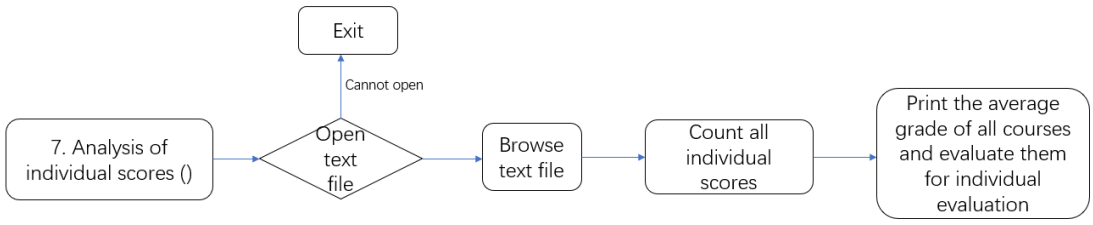

Select n/N
Exit
Cannot open
1.Add records()
Open text file
Input data
Write in text file
Empty stdin
Select whether add another data
Select y/Y


Exit
Cannot open
2.Print all records()
Open text file
Browse and print all content in text file


Exit
Cannot find
Cannot open
3.Print individual records()
Open text file
Input name
Find it from text file
Print individual records

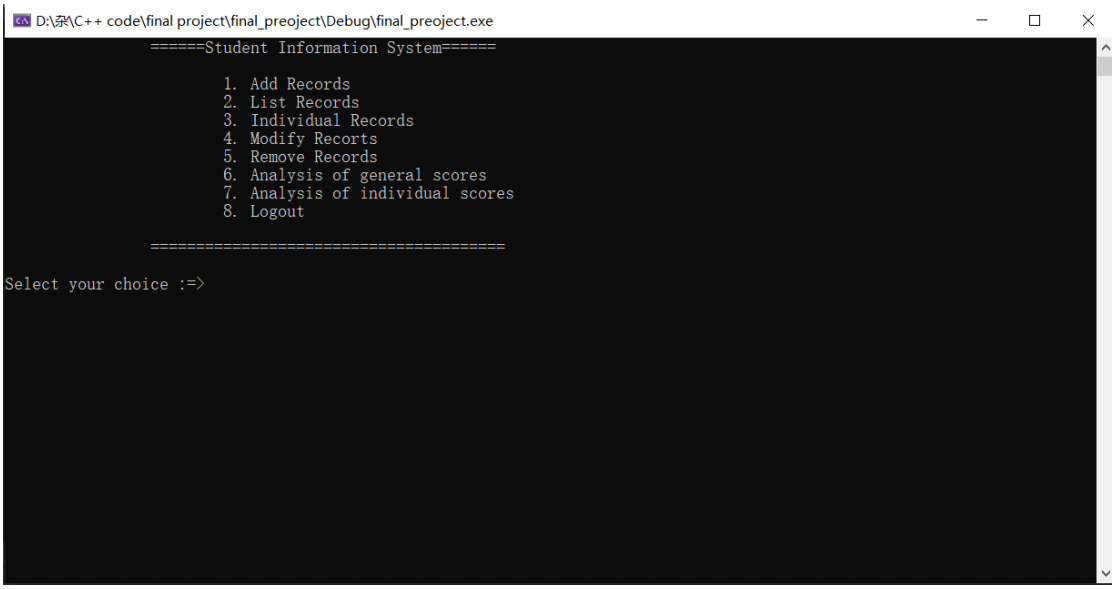

Delete temporary text file and rename the text file storing new information
Exit
Cannot open
4/5.Modify or remove records()
Open text file
Input choice (4/5)
4.Modify records
5.Remove records
Find it from text file and modify it
Find it from text file and delete it


Exit
Cannot open
6. Analysis of general records()
Open text file
Browse text file
Count general scores of each course
Print the average grade of each course and evaluate them

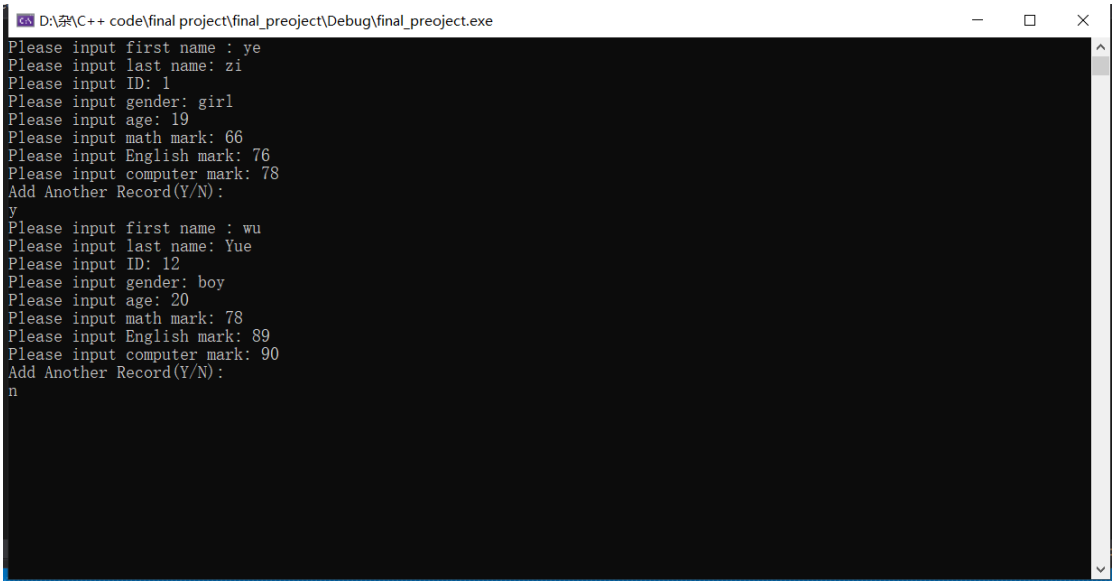

Exit
Cannot open
7. Analysis of individual scores ()
Open text file
Browse text file
Count all individual scores
Print the average grade of all courses and evaluate them for individual evaluation

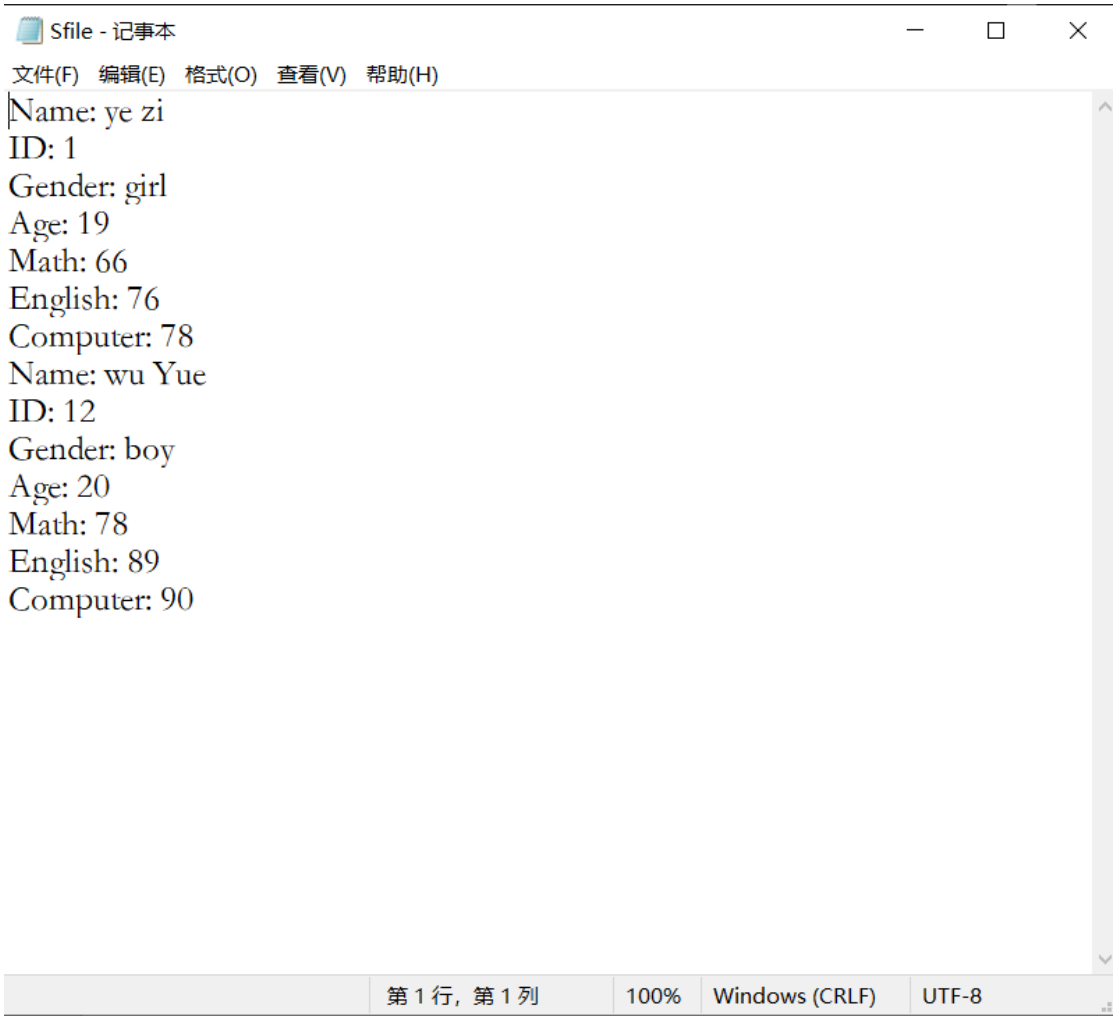
Result

The cover is printed for user to input the choice which he wants to process data.

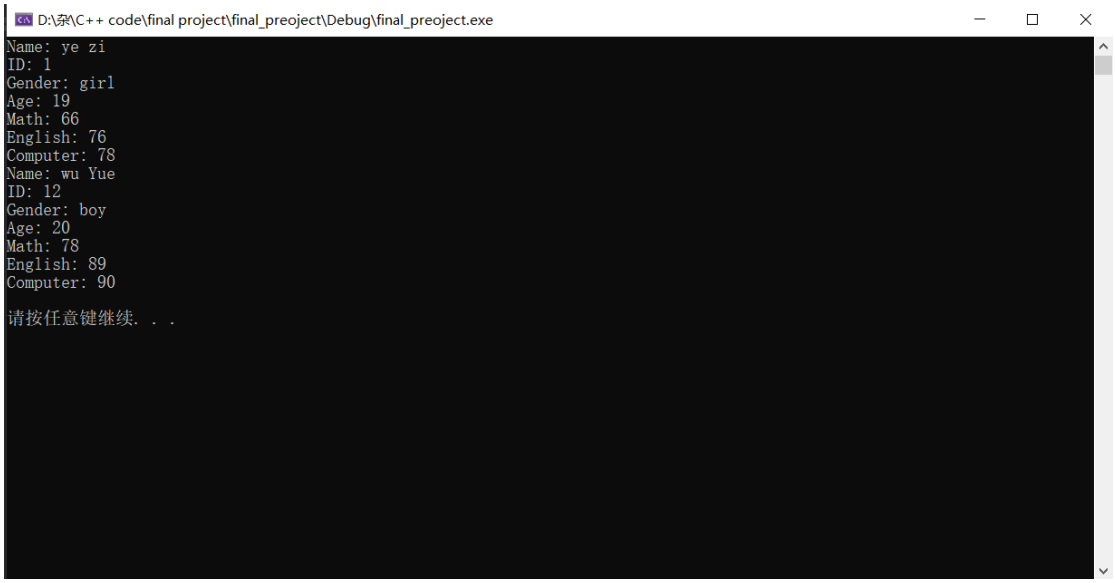


Add the information of students one by one and store them in one text file.



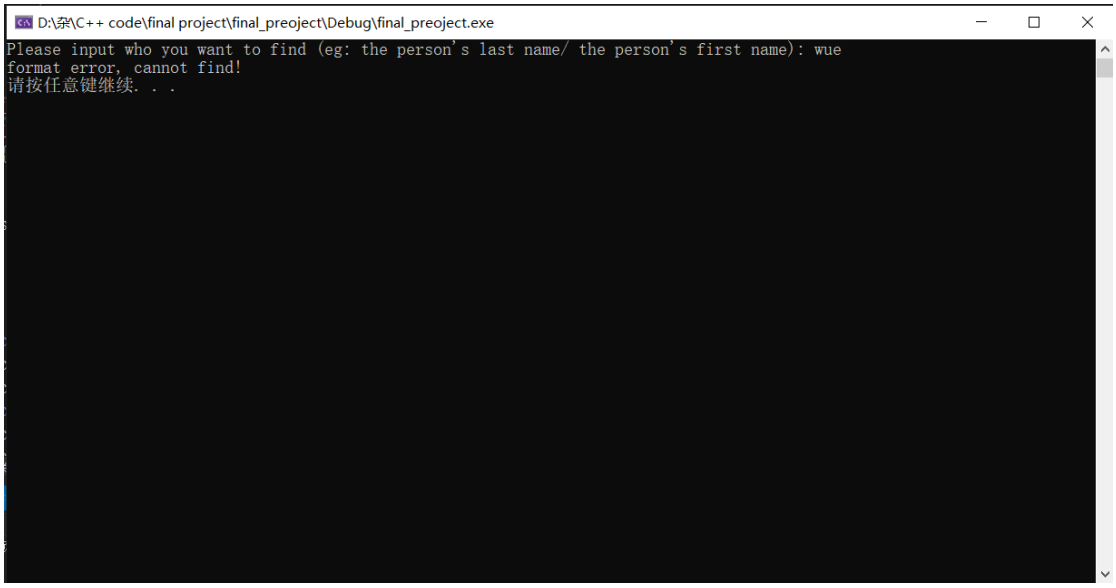


Print all information for users to check.

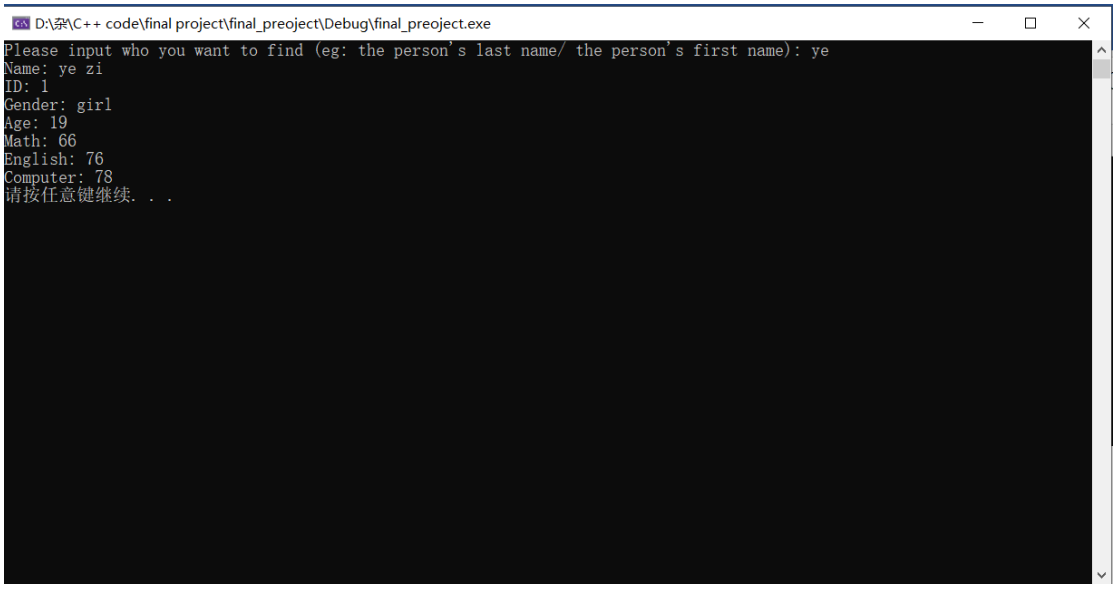


Find and print the information of the student what user want to find.

If the name input has error：



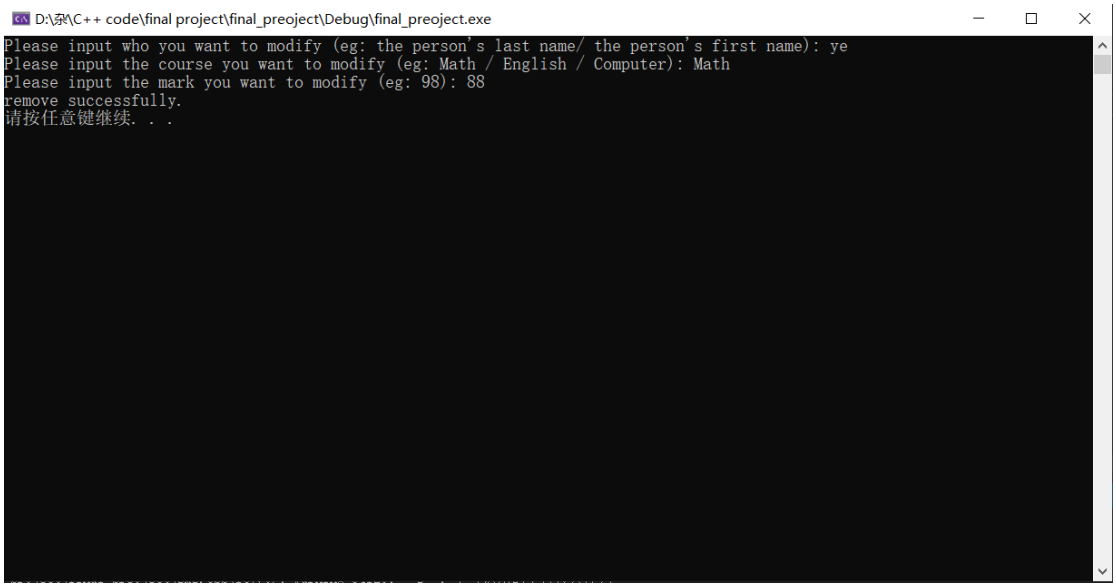
If correct：



Modify the information according to user's requirement.

If error: ("error Cannot open file Sfile!" will be printed in command window)

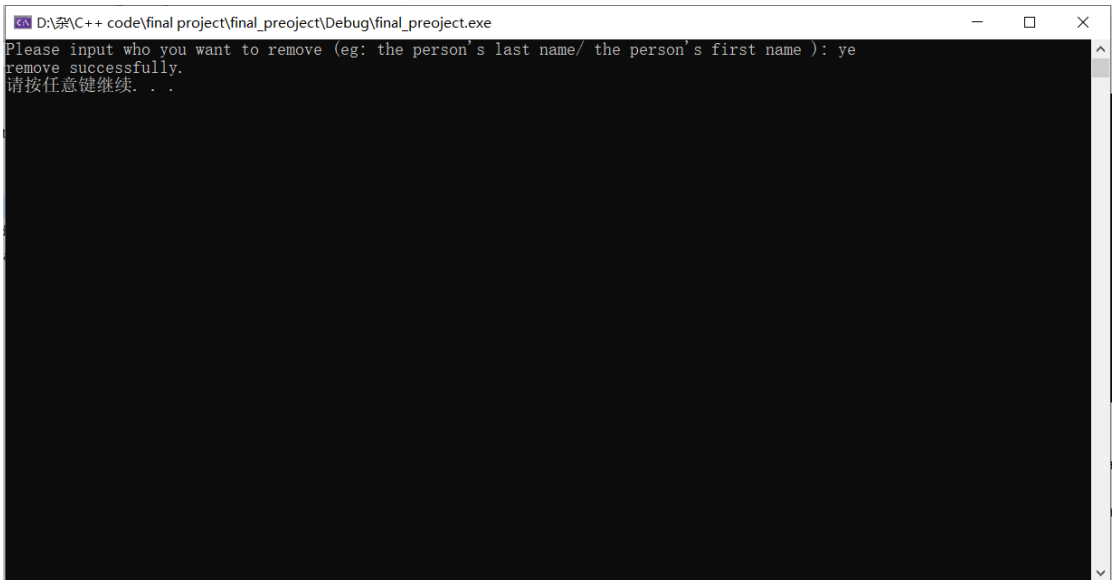
If correct:

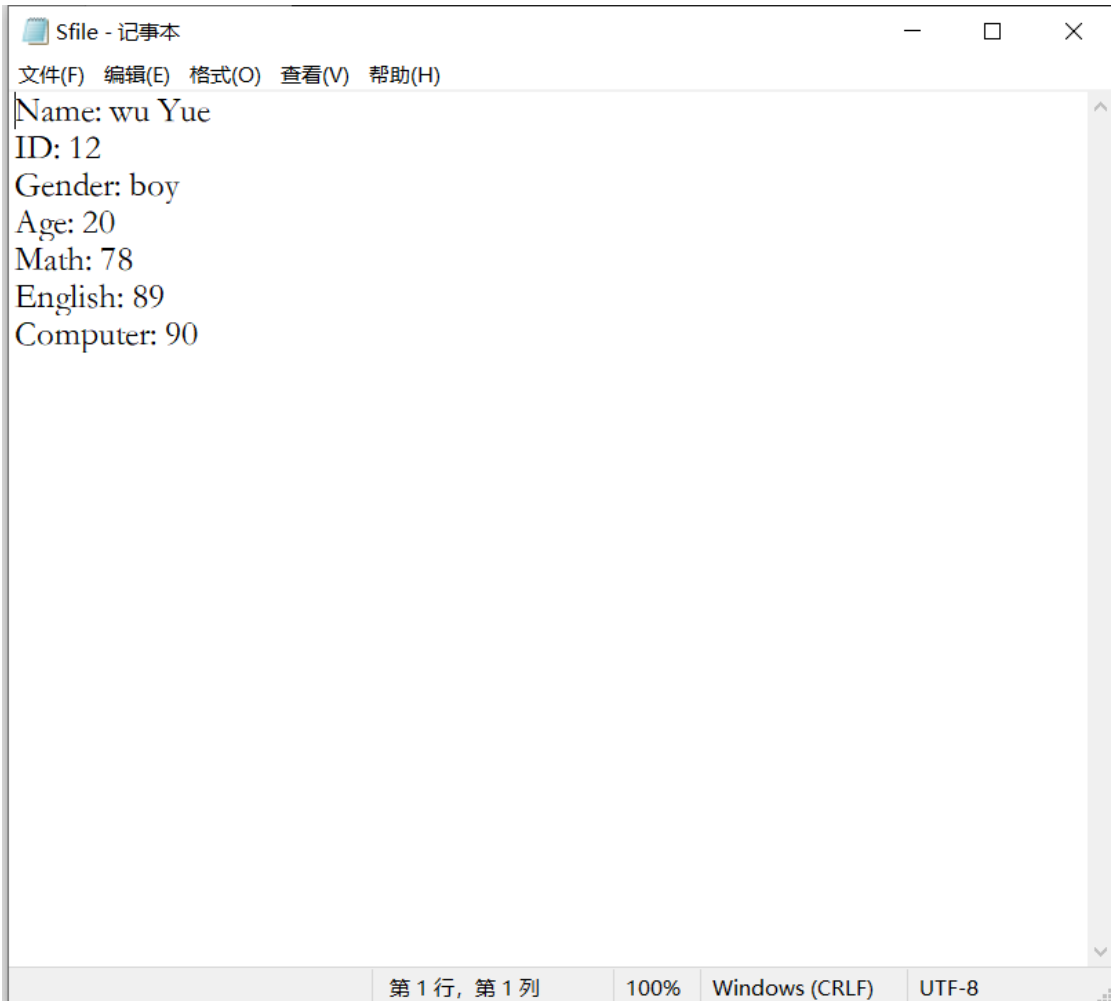


Delete the information according to user's requirement.

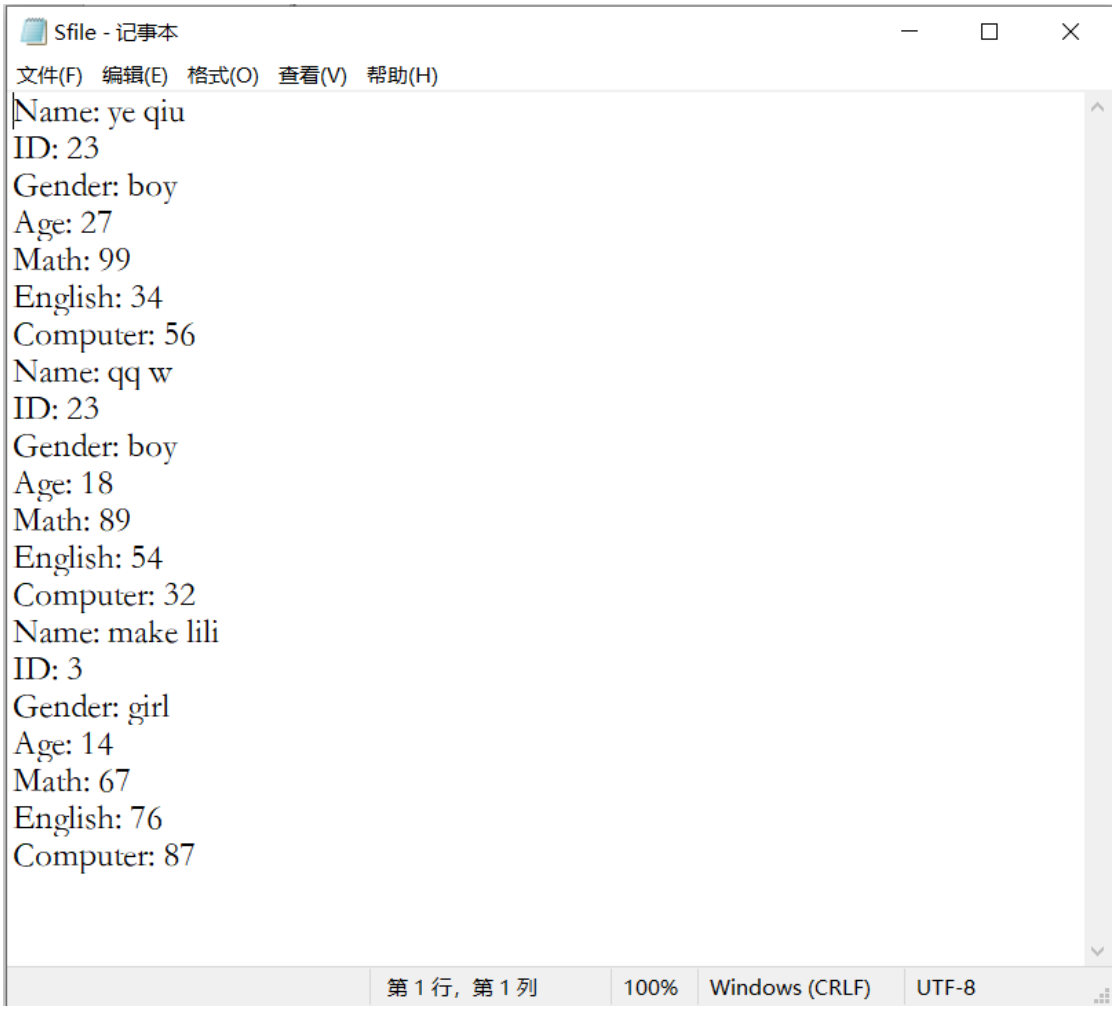
If error: ("error Cannot open file Sfile!" will be printed in command window)

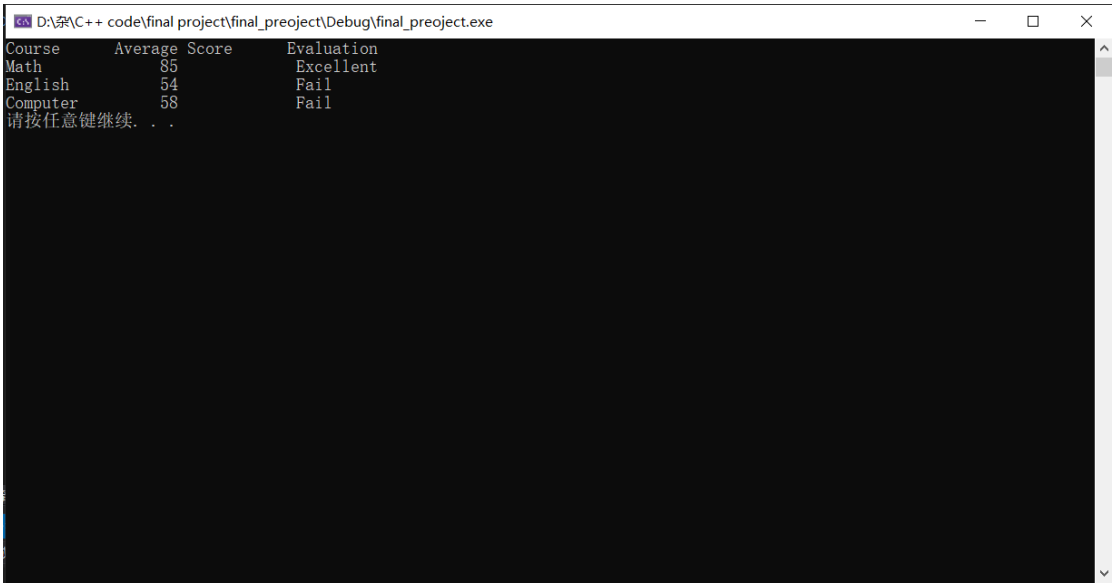
If correct:



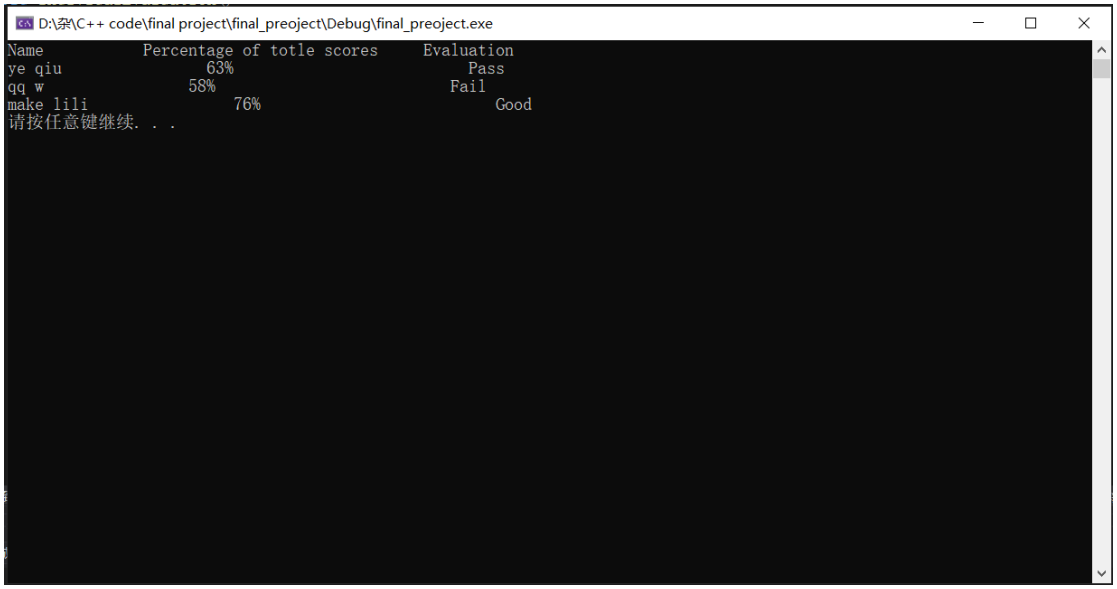

Sfile - 记事本
文件(F) 编辑(E) 格式(O) 查看(V) 帮助(H)
Name: wu Yue
ID: 12
Gender: boy
Age: 20
Math: 78
English: 89
Computer: 90
第 1 行，第 1 列
100%
Windows (CRLF)
UTF-8

Analysis the grades of each course, count their average grades and then evaluate with four levels (excellent, good, pass and fail).





Analysis the grades of each person, count their overall marks and them evaluate with four levels (excellent, good, pass and fail).



Exit system.

Conclusion and future development

Several difficulties had arisen when created this SMS system. During settling the difficulties, I have a deeper understanding of using pointer in c plus plus correctly, flexible use of multiple loops and judgements, building a perfect error handling mechanism and operating text file. Above all, the experience of creating a project is the most important things gained in the project because its process requires me think this whole project thoroughly, also think the details carefully. Through constant modification and optimization of procedures, SMS system with more practical functions becomes more secure. Therefore, SMS system can be used to make an information management system for not only person but also things that need to be registered such as books in library. With the help of system, dating things in the world can accelerate the development of the Internet of things.

Appendix of user manual

Please add the files into your *visual studio 2019* at first.

Cover

Please input the id number (1~8) of functions under the guidance.

The first time using this system please choose function 1 (input "1") to store some information, so that it can be used for analysis.

Input "1": (Add the information of students one by one and store them in one text file.)

Input the information under the guidance.

For example:

Please input first name : (input)

Please input first name : (input)

Please input ID : (input)

Please input gender : (input)

Please input age: (input number)

Please input math mark : (input number)

Please input English mark : (input number)

Please input computer mark : (input number)

Add Another Record(Y/N):

(input y/Y for inputting another person's data, or input n/N for exit this function)

Input "2": (Print all information for users to check.)

Print all information automatically.

Input "3": (Find and print the information of the student what user wants to find.)

Please input who you want to find (eg: the person's last name/ the person's first name):

(input the person's last name/ the person's first name who user wants to search)

Print the information according to what user had input.

Input "4": (Modify the information according to user's requirement.)

Please input who you want to modify (eg: the person's last name/ the person's first name): (input the person's last name/ the person's first name who user wants to search)

Please input the course you want to modify (eg: Math / English / Computer): (input the course user wants to modify)

Please input the mark you want to modify (eg: 98): (input the mark user wants to modify)

If "Success." are printed, it means the data has be modified successfully.

Input "5": (Delete the information according to user's requirement.)

Please input who you want to remove (eg: the person's last name/ the person's first name): (input the person's last name/ the person's first name who user wants to search)

If "Success." are printed, it means the data has be removed successfully.

Input "6": (Analysis the grades of each course, count their average grades and then evaluate with four levels (excellent, good, pass and fail).)

Analysis the grades of each course automatically.

Input "7": (Analysis the grades of each person, count their overall marks and them evaluate with four levels (excellent, good, pass and fail).)

Analysis the grades of each person automatically.

Input "8": (Exit system.)

Exit system.