TPP09-HW1-496470516 高翊展

```
/* ------------------------------------------------------------
// student.h
// ------------------------------------------------------------ */

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

class Student
{
    public:
        static const int SCORE_NUM = 3, NAME_LEN = 30;

        Student();

        char GetGender();
        void SetGender(char g);
        int GetAge();
        void SetAge(int a);
        char* GetName();
        void SetName(char *n);
        int GetScore(int position);
        void SetScore(int position, int s);


    private:
        char name_[NAME_LEN], gender_;
        int score_[SCORE_NUM], age_;
};

/* ------------------------------------------------------------
// student.cpp
// ------------------------------------------------------------ */

#include<stdio.h>
#include<string.h>
#include"student.h"
```

```
Student::Student()
{
    for(int i = 0 ; i < NAME_LEN ; i++)
    {
        name_[i] = '\0';
    }

    for(int i = 0 ; i < SCORE_NUM ; i++)
    {
        score_[i] = 0;
    }
}

char Student::GetGender()
{
    return gender_;
}

void Student::SetGender(char gender)
{
    gender_ = gender;
}

int Student::GetAge()
{
    return age_;
}

void Student::SetAge(int age)
{
    age_ = age;
}

char *Student::GetName()
{
    return name_;
}
```

```
void Student::SetName(char name[])
{
    strcpy(name_,name);
}

int Student::GetScore(int position)
{
    return score_[position];
}

void Student::SetScore(int position, int score)
{
    score_[position] = score;
}

/* ----------------------------------------------------------------
// database.h
// ---------------------------------------------------------------- */

#include<stdio.h>
#include"student.h"

class Database{
    public:
        static const int DATA_NUM = 200;

        Database();

        void AddData(Student person);
        void Display();
        void ReadFromFile(char filename[]);
        void WriteToFile(char filename[]);
        void Instruction();

    private:
        int position_;
        Student data_[DATA_NUM];
};
```

```
/* ------------------------------------------------------------
// database.cpp
// ------------------------------------------------------------ */

#include<stdio.h>
#include<stdlib.h>
#include<string.h>
#include"database.h"
/*
 * exchange two value
 */
void Swap(Student &a , Student &b)
{
    Student t = a;
    a = b;
    b = t;
}
/*
 * sort data by name
 */
void Insertion_Sort(Student data[] , int size)
{
    int i;
    Student temp;
    for(int j = 1 ; j < size ; j++){
        temp = data[j];                    /* 先複製資料出來作爲比較用 */
        i = j-1;
        while(strcmp(temp.GetName(), data[i].GetName()) == -1 && i>=0)
        /* 如果 temp 小於他前面那個 */
        {
            Swap(data[i+1],data[i]);           /* 則兩者做交換 */
            data[i] = data[i+1];
            i--;                               /* 繼續向前比較 */
        }
        data[i+1] = temp;                      /* 填入 temp 所在的位置 */
    }
}
```

```
/*
 * constructor
 */
Database::Database()
{
    position_ = 0;
}

/*
 * selection menu
 */
void Database::Instruction()
{
    printf("\nA simple database program\n\n");
    printf("(1) Add a reocrd\n");
    printf("(2) Show all records\n");
    printf("(3) Output record to a text file\n");
    printf("(4) Read in records from a text file\n");
    printf("(5) Exit the program\n\n");
    printf("Please select a function...> ");
}

/*
 * add record in database
 */
void Database::AddData(Student person)
{
    data_[position_] = person;
    position_++;
    Insertion_Sort(data_, position_);
}

/*
 * display all record in database
 */
void Database::Display()
{
    for(int i = 0 ; i < position_ ; i++)
```

```
    {
      printf("%s %c (%d) ",data_[i].GetName(), data_[i].GetGender(),
data_[i].GetAge());
       for(int j = 0 ; j < Student::SCORE_NUM ; j++)
       {
          printf("%d ",data_[i].GetScore(j));
       }
       printf("\n");
    }
}

/*
 * read record from file
 */
void Database::ReadFromFile(char filename[]){
    FILE *fileptr;
    char gender, name[Student::NAME_LEN] = {'\0'};
    int age, score, i;
    if((fileptr = fopen(filename, "r")) != NULL){
       for(i = 0 ; fscanf(fileptr,"%s",&name) != EOF ; i++){
          fscanf(fileptr, " %c %d ", &gender, &age);
          data_[i].SetName(name);
          data_[i].SetGender(gender);
          data_[i].SetAge(age);
          for(int j = 0 ; j < Student::SCORE_NUM ; j++){
             fscanf(fileptr, "%d ", &score);
             data_[i].SetScore(j, score);
          }
       }
       position_ = i;
    }
    else
    {
       printf("File Not Found\n");
    }
    fclose(fileptr);
}
```

```
/*
 * output all record to a file
 */
void Database::WriteToFile(char filename[])
{
    FILE *fileptr = fopen(filename, "w");

    for(int i = 0 ; i < position_ ; i++)
    {
        fprintf(fileptr, "%s %c %d ",data_[i].GetName(),
data_[i].GetGender(), data_[i].GetAge());
        for(int j = 0 ; j < Student::SCORE_NUM ; j++)
        {
            fprintf(fileptr, "%d ",data_[i].GetScore(j));
        }
        fprintf(fileptr, "\n");
    }
    position_ = 0;
    fclose(fileptr);
}
/* ----------------------------------------------------------------
// main.cpp
// ---------------------------------------------------------------- */

#include<stdio.h>
#include<stdlib.h>
#include"database.h"

int main()
{
    Database database;
    Student std_data;
    int choice = 1;
    char filename[Student::NAME_LEN];

    while(choice != 5)
    {
        database.Instruction();
```

```
        scanf("%d",&choice);
        switch(choice)
        {
            case 1:   /* Add a reocrd */
                int age, score;
                char gender, name[Student::NAME_LEN];

                getchar();

                printf("\nPlease enter student's name : ");
                gets(name);
                std_data.SetName(name);

                printf("Please enter student's gender(M/F) : ");
                scanf("%c", &gender);
                std_data.SetGender(gender);

                printf("Please enter student's age : ");
                scanf("%d", &age);
                std_data.SetAge(age);

                for(int i = 0 ; i < Student::SCORE_NUM ; i++)
                {
                    printf("Please enter student's %dth score : ", i+1);
                    scanf("%d", &score);
                    std_data.SetScore(i, score);
                }

                database.AddData(std_data);
                break;
            case 2:   /* Show all records */
                database.Display();
                break;
            case 3:   /* Output record to a text file */
                getchar();
                printf("\nPlease enter input file name : ");
                gets(filename);
                database.WriteToFile(filename);
```

```
            break;
        case 4:   /* Read in records from a text file */
            getchar();
            printf("\nPlease enter output file name : ");
            gets(filename);
            database.ReadFromFile(filename);
            break;
        default:
            break;
      }
   }

   return 0;
}
```