题目：

假设有3个学生，每个学生有三门课的成绩，设计程序从键盘输入每个学生的相关数据(具体包括学号、姓名、语文成绩、数学成绩、英语成绩，每个学生的具体数据内容由设计者自定)，并要求计算出每个学生的平均成绩并进行保存。存储学生数据的结构模型可以选择线性表或者单向链表，数据结构中结构变量的组成元素和类型由设计者根据题目要求自己定义。

将已输入的学生数据信息和计算出的平均分数写入文件stud.txt，并通过读取该文件显示到屏幕上来检查stud.txt文件中的学生平均分计算是否正确。

#include<stdio.h>

#include<stdlib.h>

#include<malloc.h>

#include<string.h>

typedef struct student

{

char num[10];//number

char name[8];//name

float chinese;//chinese score

float math;//math score

float english;//english score

struct student\* pnext;

}stu;

stu\* creat(char\*);

void recod\_aver(char\*, stu\*);

void writfile(char\*, int, float);

void prifile(char\*);

void release(stu\*);

int main()

{

stu\* phead = NULL;

phead = creat("./stud.txt");//创建链表

recod\_aver("./stud.txt", phead);//计算并写入文件

prifile("./stud.txt");//读取文件

release(phead);//释放内存

return 0;

}

/\*Create the chain table\*/

stu\* creat(char\* file)

{

char num[10];//number

char name[8];//name

float chinese;//chinese score

float math;//math score

float english;//english score

//assign the head node

stu\* phead = (stu\*)malloc(sizeof(stu));

if (phead == NULL)

{

printf("分配失败！\n");

exit(-1);

}

stu\* ptail = phead;

int i = 1;

for (i = 1; i <= 3; i++)

{

printf("\n请输入第%d名同学的信息：\n", i);

printf("Number：");

gets(num);

printf("Name：");

gets(name);

printf("Chinese Score：");

scanf("%f", &chinese);

getchar();//Empty the buffer

printf("Math Score：");

scanf("%f", &math);

getchar();//Empty the buffer

printf("English Score：");

scanf("%f", &english);

getchar();//Empty the buffer

//assign a new node

stu\* pnew = (stu\*)malloc(sizeof(stu));

if (pnew == NULL)

{

printf("分配失败！\n");

exit(-1);

}

pnew->num[10] = num;

pnew->name[8] = name;

pnew->chinese = chinese;

pnew->math = math;

pnew->english = english;

ptail->pnext = pnew;

ptail = ptail->pnext;

//write to file

FILE\* fp = NULL;

fp = fopen(file, "a+");//open the file

if (fp == NULL)

{

perror("creat fopen");

return;

}

fprintf(fp, "\nNO.%d student's information：\n", i);

fprintf(fp, "number：%s\n", num);

fprintf(fp, "name：%s\n", name);

fprintf(fp, "chinese：%f\n", chinese);

fprintf(fp, "math：%f\n", math);

fprintf(fp, "english：%f\n", english);

fclose(fp);//close the file

fp == NULL;//置空文件指针

}

ptail->pnext = NULL;

return phead;

}

/\*Calculate and record\*/

void recod\_aver(char\* file, stu\* phead)

{

int i = 1;

stu\* tmp = phead->pnext;

//循环计算并写入文件

while (tmp != NULL)

{

float c, m, e;

c = tmp->chinese;

m = tmp->math;

e = tmp->english;

float a;

a = (c + m + e) / 3;

writfile(file, i, a);

i++;

tmp = tmp->pnext;

}

return;

}

/\*Write to file\*/

void writfile(char\* file, int i, float a)

{

FILE\* fp = NULL;

fp = fopen(file, "a+");//open the file

if (fp == NULL)

{

perror("writfile fopen");

return;

}

fprintf(fp, "\nNO.%d student's average score is: %f\n", i, a);

fclose(fp);//close the file

fp == NULL;//置空文件指针

return;

}

/\*print the file\*/

void prifile(char\* file)

{

FILE\* fp = NULL;

fp = fopen(file, "r+");//open the file

if (fp == NULL)

{

perror("putfile fopen");

return;

}

printf("\n/\*\*\*\*\*\*\*\*\*\*文件内容为：\*\*\*\*\*\*\*\*\*\*/\n");

char ch;

while ((ch = fgetc(fp)) != EOF)

printf("%c", ch);

printf("\n");

fclose(fp);//close the file

fp = NULL;//置空文件指针

return;

}

/\*Release memory\*/

void release(stu\* phead)

{

stu\* tmp = phead;

stu\* temp = phead;

while (temp)

{

tmp = temp;

temp = temp->pnext;

free(tmp);

}

return;

}

