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**Tài liệu C Assignment**

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| **Họ và tên** | **Nguyễn Minh Tân** | **Lớp** | **T1212L-FAT2** |

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# Phần 1: Đặt vấn đề

Đề bài *Assignment*:

Viết chương trình (giống như) trò chơi xếp hình tetris.

# Phần 2: Quy trình thực hiện

## Lập kế hoạch

Lịch học hiện tại:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Weeks** | **From** | **To** | **Mon** | **Tue** | **Thu** | **Fri** |
| **Lab** | **Theory** | **Lab** | **Theory** |
| 10 | 03/02/2013 | 09/02/2013 | Nghỉ tết | | | |
| 11 | 10/02/2013 | 16/02/2013 |
| 12 | 17/02/2013 | 23/02/2013 | C - L10 | C - T11 | C - L11 | C - T12 |
| 13 | 24/02/2013 | 02/03/2013 | C - L12 |  | C - L13 |  |
| 14 | 03/03/2013 | 09/03/2013 | C - L14 |  | **C - E2** |  |

Lịch cho assignment:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Weeks** | **From** | **To** | **Mon** | **Tue** | **Wed** | **Thu** | **Fri** | **Sat** |
| 10 | 03/02/2013 | 09/02/2013 | Asm |  |  | Asm |  |  |
| 11 | 10/02/2013 | 16/02/2013 | Asm |  |  | Asm |  |  |
| 12 | 17/02/2013 | 23/02/2013 |  |  | Asm |  |  | Asm |
| 13 | 24/02/2013 | 02/03/2013 |  |  | Asm |  |  | Asm |

Các mục tiêu cần đạt cho *assignment*:

* Chạy được trò chơi, không có lỗi.
* Thêm một số tính năng phụ: tùy chỉnh, tính điểm, lưu điểm.

## 

## Phân tích thiết kế

Lưu đồ trò chơi



## Triển khai code

Main.c:

/\*

Name: Tetris game

Copyright: M.Tan

Author: M.Tan

Date: 01/03/13 17:12

Description: Version 1.86

\*/

#include <stdio.h>

#include <stdlib.h>

#include <conio.h>

#include <string.h>

#include <windows.h>

int LIMIT\_H = 14, LIMIT\_C = 12; // gioi han khung: hang, cot

int main(int argc, char \*argv[]){

system("MODE 32,16"); // chinh kich co man hinh console

do{ // bat dau choi

int ktq; // bien kiem tra de thoat khi dang choi

int diem, speed; // diem, toc do chay man hinh

int base[LIMIT\_H][LIMIT\_C]; // khung[gioi han hang][gioi han cot]

int khoi[3][3]; // khoi

int kn, kd; // vi tri khoi ngang, vi tri khoi doc

do{

diem = 0;

speed = 800;

kt\_kiluc();

menu\_chinh(&speed);

system("cls");

khoi\_taokhung(base);

int h, c, rd; // hang, cot, random

while ( kt\_fullsao(1, 1, 1, LIMIT\_C-2, base) ){ // Kiem tra dieu kien gameover

rd = khoi\_taomoi(khoi);

kd = LIMIT\_C/2-2;

// bat dau in

for (kn = 0; kn <= LIMIT\_H-3; kn ++){

for (h = 1; h <= LIMIT\_H-1; h ++){

for (c = 0; c <= LIMIT\_C-1; c ++){

if ( c == 0 || c == LIMIT\_C-1 ) // in khung

printf("|");

else if ( h == LIMIT\_H-1 ) // in day

printf("-");

else if ( h >= kn && h <= kn+2 && c >= kd && c <= kd+2) // in khoi

khoi\_in(h, c, base, khoi, &kn, &kd);

else if ( base[h][c] == 1 ) // in sao

printf("\*");

else if ( base[h][c] == 0 ) // in space

printf(" ");

}

printf("\n");

}

printf("\nDiem hien tai: %d", diem);

ktq = khoi\_dichuyen(rd, base, khoi, &kn, &kd);

if (ktq == 1)

break;

sleep(speed);

system("cls");

if ( kt\_cham(base, khoi, &kn, &kd) )

break;

}

if (ktq == 1)

break;

diem = kt\_an(diem, &speed, base);

}

}while (ktq != 0);

printf("\nGAME OVER!\n\n");

system("PAUSE");

kt\_highscore(diem);

}while ( kt\_choitiep() );

return 0;

}

Kiemtra.c:

// Cac ham kiem tra

#include <stdio.h>

#include <stdlib.h>

#include <conio.h>

#include <string.h>

#include "struct\_score.h"

/\*

kt\_fullsao(bat dau ngang, bat dau doc, ket thuc ngang, ket thuc doc, khung)

kiem tra 1 hoac nhieu hang co chua day sao hay khong,

tra ve 1 neu tat ca cac hang chua day sao, 0 neu co khoang trong

\*/

int kt\_fullsao(int bdn, int bdd, int lmn, int lmd, int base[LIMIT\_H][LIMIT\_C]){

int dh, dc;

for (dh = bdn; dh <= lmn; dh ++){

for (dc = bdd; dc <= lmd; dc ++)

if ( base[dh][dc] == 1 )

break;

}

if (dh > lmn && dc > lmd)

return(1);

else

return(0);

}

/\*

kiem tra an(diem, speed, khung)

tra ve diem, tang speed theo diem tuong ung

\*/

int kt\_an(int diem, int \*speed, int base[LIMIT\_H][LIMIT\_C]){

int dh, dc, ah;

for (dh = LIMIT\_H-2; dh >= 1; dh --){

for (dc = 1; dc <= LIMIT\_C-2; dc ++)

if (base[dh][dc] != 1)

break;

if (dc > LIMIT\_C-2){

for (ah = dh; ah > 1; ah --){

for (dc = 1; dc <= LIMIT\_C-2; dc ++)

base[ah][dc] = base[ah-1][dc];

}

diem += 10;

\*speed -= 10;

dh ++;

}

}

return(diem);

}

/\*

kiem tra va cham(khung, khoi, vi tri khoi ngang, vi tri khoi doc)

tra ve 1 neu cham day, 0 neu khong cham

\*/

int kt\_cham(int base[LIMIT\_H][LIMIT\_C], int khoi[3][3], int \*kn, int \*kd){

int dh, dc;

if ( khoi[2][0] == 1 && base[(\*kn)+3][(\*kd)] == 1 ||

khoi[2][1] == 1 && base[(\*kn)+3][(\*kd)+1] == 1 ||

khoi[2][2] == 1 && base[(\*kn)+3][(\*kd)+2] == 1 ||

khoi[1][0] == 1 && base[(\*kn)+2][(\*kd)] == 1 ||

khoi[1][1] == 1 && base[(\*kn)+2][(\*kd)+1] == 1 ||

khoi[1][2] == 1 && base[(\*kn)+2][(\*kd)+2] == 1 ||

khoi[0][0] == 1 && base[(\*kn)+1][(\*kd)] == 1 ||

khoi[0][1] == 1 && base[(\*kn)+1][(\*kd)+1] == 1 ||

khoi[0][2] == 1 && base[(\*kn)+1][(\*kd)+2] == 1 ){

for (dh = 0; dh <= 2; dh ++)

for (dc = 0; dc <= 2; dc ++)

if ( base[(\*kn)+dh][(\*kd)+dc] != 1 )

base[(\*kn)+dh][(\*kd)+dc] = khoi [dh][dc];

return (1);

}

else

return (0);

}

// kiem tra - tao file ki luc

void kt\_kiluc(){

struct score kl;

FILE \*tt;

if ( (tt = fopen("highscore.tan", "r")) == NULL ){

kl.diem = 0;

strcpy(kl.ten, "none");

tt = fopen("highscore.tan", "w");

fwrite(&kl, sizeof(struct score), 1, tt);

fclose(tt);

}

}

// kiem tra ki luc

void kt\_highscore(int diem){

struct score kl;

FILE \*tt;

tt = fopen("highscore.tan", "r+w");

fread (&kl, sizeof(struct score), 1, tt);

if ( diem != 0 && diem > kl.diem ){

system("cls");

kl.diem = diem;

printf("\nNEW HIGH SCORE!\nNhap ten: ");

gets (kl.ten);

rewind(tt);

fwrite (&kl, sizeof(struct score), 1, tt);

}

fclose(tt);

}

/\*

kiem tra choi tiep

tra ve 1 de tiep tuc, 0 de thoat

\*/

int kt\_choitiep(){

char lc;

while ( lc < 49 || lc > 50 ){

system("cls");

printf("\nTiep tuc ?");

printf("\n1 - Choi tiep\n2 - Nghi");

printf("\nLua chon: ");

scanf("%c", &lc);

fflush(stdin);

if ( lc == '1' ){

return 1;

}

if ( lc == '2' )

return 0;

}

}

Menu.c:

// Cac ham menu

#include <stdio.h>

#include <stdlib.h>

#include <conio.h>

#include <string.h>

#include "struct\_score.h"

// menu chinh

int menu\_chinh(int \*speed){

char lc;

while ( lc < 49 || lc > 53){

system("cls");

printf("\n --- Tetris by M.Tan :D ---\n");

printf("\nMenu:");

printf("\n1 - Huong dan");

printf("\n2 - Bat dau choi");

printf("\n3 - Tuy chinh");

printf("\n4 - Ki luc");

printf("\n5 - Thoat");

printf("\nLua chon: ");

scanf("%c", &lc);

fflush(stdin);

if (lc == '1')

lc = menu\_huongdan();

if (lc == '2')

return(0);

if (lc == '3')

lc = menu\_option(speed);

if (lc == '4')

lc = menu\_highscore();

if (lc == '5')

exit(0);

}

}

// menu huong dan

int menu\_huongdan(){

system("cls");

printf("\nAn 'a' hoac '1' de sang trai,");

printf("\n 'd' hoac '3' de sang phai,");

printf("\n 's' hoac '2' de xuong,");

printf("\n 'w' hoac '5' de xoay,");

printf("\n 'p' hoac '8' de tam dung,");

printf("\n 'u' hoac '9' de tiep tuc,");

printf("\n 'q' hoac '7' de quay lai.");

printf("\n\n");

system("PAUSE");

return 0;

}

// menu tuy chinh

int menu\_option(int \*speed){

char lc;

while ( lc < 49 || lc > 53){

system("cls");

printf("\nChon do kho:");

printf("\n1 - Rat de");

printf("\n2 - De");

printf("\n3 - Kho");

printf("\n4 - Rat kho");

printf("\n5 - Quay lai");

printf("\nLua chon: ");

scanf("%c", &lc);

fflush(stdin);

if (lc == '1'){

\*speed = 800;

printf("\nDa chon muc do: Rat de\n\n");

system("PAUSE");

break;

}

if (lc == '2'){

\*speed = 700;

printf("\nDa chon muc do: De\n\n");

system("PAUSE");

break;

}

if (lc == '3'){

\*speed = 500;

printf("\nDa chon muc do: Kho\n\n");

system("PAUSE");

break;

}

if (lc == '4'){

\*speed = 400;

printf("\nDa chon muc do: Rat kho\n\n");

system("PAUSE");

break;

}

if (lc == '5')

break;

}

return 0;

}

// menu ki luc

int menu\_highscore(){

struct score kl;

system("cls");

FILE \*tt;

tt = fopen("highscore.tan", "r");

fread (&kl, sizeof(struct score), 1, tt);

printf("\nKi luc hien tai:");

printf("\nTen : %s", kl.ten);

printf("\nDiem : %d", kl.diem);

fclose(tt);

printf("\n\n");

system("PAUSE");

return 0;

}

Khoi.c:

// Cac ham thao tac khoi

#include <stdio.h>

#include <stdlib.h>

#include <conio.h>

#include <string.h>

#include "struct\_score.h"

/\*

tao khung

gan gia tri cho khung, day va cac khoang trong

\*/

void khoi\_taokhung(int base[LIMIT\_H][LIMIT\_C]){

int dh, dc;

for (dh = 0; dh <= LIMIT\_H-1; dh ++){

for (dc = 0; dc <= LIMIT\_C-1; dc ++){

if ( dc == 0 || dc == LIMIT\_C-1 || dh == LIMIT\_H-1 )

base[dh][dc] = 1;

else

base[dh][dc] = 0;

}

}

}

// in khoi(hang, cot, khung, khoi, vi tri khoi ngang, vi tri khoi doc)

void khoi\_in(int h, int c, int base[LIMIT\_H][LIMIT\_C], int khoi[3][3], int \*kn, int \*kd){

int dh, dc;

for (dh = 0; dh <= 2; dh ++){

for (dc = 0; dc <= 2; dc ++){

if ( h == (\*kn)+dh && c == (\*kd)+dc ){

if ( khoi[dh][dc] == 1 )

printf("\*");

else if ( base[(\*kn)+dh][(\*kd)+dc] == 1 )

printf("\*");

else

printf(" ");

}

}

}

}

// xoay khoi

void khoi\_xoay(int khoi[3][3]){

int dh, dc;

int khoitg[3][3];

for (dh = 0; dh <= 2; dh ++)

for (dc = 0; dc <=2; dc ++)

khoitg[dh][dc] = khoi[dh][dc];

for (dh = 0; dh <= 2; dh ++)

for (dc = 0; dc <=2; dc ++)

khoi[dh][dc] = khoitg[2-dc][dh];

}

/\*

di chuyen khoi (chi so random khoi, khung, khoi, vi tri khoi ngang, vi tri khoi doc)

tra ve 1 de thoat khoi tro choi

\*/

int khoi\_dichuyen(int rd, int base[LIMIT\_H][LIMIT\_C], int khoi[3][3], int \*kn, int \*kd){

char dich;

int dh, dc;

while( kbhit() ){

dich = getch();

if ( dich == 'd' || dich == '3' ){ // sang phai

for (dh = 2; dh >= 0; dh --){

for (dc = 2; dc >= 0; dc --){

if ( khoi[dh][dc] == 1 )

break;

}

if ( base[(\*kn)+dh][(\*kd)+dc+1] == 1 )

break;

}

if ( dh < 0){

(\*kd) ++;

}

fflush(stdin);

//return 0;

}

else if ( dich == 'a' || dich == '1' ){ // sang trai

for (dh = 2; dh >= 0; dh --){

for (dc = 0; dc <= 2; dc ++){

if ( khoi[dh][dc] == 1 )

break;

}

if ( base[(\*kn)+dh][(\*kd)+dc-1] == 1 )

break;

}

if ( dh < 0){

(\*kd) --;

}

fflush(stdin);

//return 0;

}

else if ( dich == 's' || dich == '2' && (\*kn)+4 < LIMIT\_H-1 ){ // xuong

for (dc = 0; dc <= 2; dc ++){

for (dh = 2; dh >= 0; dh --){

if ( khoi[dh][dc] == 1 )

break;

}

if ( base[(\*kn)+dh+1][(\*kd)+dc] == 1 &&

(\*kd) != 0 && (\*kd)+2 != LIMIT\_C-1 )

break;

}

if ( dc > 2){

(\*kn) ++;

}

fflush(stdin);

//return 0;

}

else if ( dich == 'w' || dich == '5' && rd != 4 ){ // xoay

if ( kt\_fullsao((\*kn), (\*kd), (\*kn)+2, (\*kd)+2, base) ){

khoi\_xoay(khoi);

}

fflush(stdin);

//return 0;

}

else if ( dich == 'q' || dich == '7'){ // quit

return 1;

}

else if ( dich == 'p' || dich == '8'){ // pause

while ( 1 ){

while ( kbhit() )

dich = getch();

if ( dich == 'u' || dich == '9')

break;

}

fflush(stdin);

//return 0;

}

}

return 0;

}

/\*

tao khoi moi

tra ve random de nhan biet khoi

\*/

int khoi\_taomoi(int khoi[3][3]){

srand(time(NULL));

int rd = ( rand() % 7 + rand() ) % 7;

switch (rd){

case 1: // khoi L nguoc

khoi[0][0] = 0; khoi[0][1] = 1; khoi[0][2] = 0;

khoi[1][0] = 0; khoi[1][1] = 1; khoi[1][2] = 0;

khoi[2][0] = 1; khoi[2][1] = 1; khoi[2][2] = 0;

break;

case 2: // khoi L

khoi[0][0] = 0; khoi[0][1] = 1; khoi[0][2] = 0;

khoi[1][0] = 0; khoi[1][1] = 1; khoi[1][2] = 0;

khoi[2][0] = 0; khoi[2][1] = 1; khoi[2][2] = 1;

break;

case 3: // khoi I

khoi[0][0] = 0; khoi[0][1] = 1; khoi[0][2] = 0;

khoi[1][0] = 0; khoi[1][1] = 1; khoi[1][2] = 0;

khoi[2][0] = 0; khoi[2][1] = 1; khoi[2][2] = 0;

break;

case 4: // khoi vuong

khoi[0][0] = 0; khoi[0][1] = 0; khoi[0][2] = 0;

khoi[1][0] = 0; khoi[1][1] = 1; khoi[1][2] = 1;

khoi[2][0] = 0; khoi[2][1] = 1; khoi[2][2] = 1;

break;

case 5: // khoi S

khoi[0][0] = 1; khoi[0][1] = 0; khoi[0][2] = 0;

khoi[1][0] = 1; khoi[1][1] = 1; khoi[1][2] = 0;

khoi[2][0] = 0; khoi[2][1] = 1; khoi[2][2] = 0;

break;

case 6: // khoi S nguoc

khoi[0][0] = 0; khoi[0][1] = 0; khoi[0][2] = 1;

khoi[1][0] = 0; khoi[1][1] = 1; khoi[1][2] = 1;

khoi[2][0] = 0; khoi[2][1] = 1; khoi[2][2] = 0;

break;

default: // khoi T

khoi[0][0] = 0; khoi[0][1] = 0; khoi[0][2] = 0;

khoi[1][0] = 0; khoi[1][1] = 1; khoi[1][2] = 0;

khoi[2][0] = 1; khoi[2][1] = 1; khoi[2][2] = 1;

break;

}

return (rd);

}

Struct\_score.h

extern LIMIT\_H, LIMIT\_C; // hang toan cuc gioi han khung

struct score{

char ten[30];

int diem;

}; // cau truc thong tin ki luc: ten, diem

Hết.

## Nhận xét của giảng viên

<*Phần này chỉ dành cho giảng viên*>

Biết cách lập kế hoạch?

⬜Tốt ⬜Khá ⬜Trung bình ⬜Yếu

Thực hiện đúng quy trình?

⬜Tốt ⬜Khá ⬜Trung bình ⬜Yếu

Nhận xét chung về assignment?

⬜Tốt ⬜Khá ⬜Trung bình ⬜Yếu

Khác:......................................................................................................................................................................................................................................................................................................................................................................................................................................................................................

## 

## Tự đánh giá và rút kinh nghiệm

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# Tài liệu tham khảo

* <http://www.cplusplus.com>
* <http://stackoverflow.com/>
* <http://congdongcviet.com/>