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**信息学院**

**班级：计算机科学与技术3班**

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**Linux大作业**

1. **需求分析**
2. **程序的输入与输出：只需通过键盘“上”、“下”、“左”、“右”移动光标在棋盘上的位置，“空格”表示落子。**
3. **程序的系统功能：五子棋**
4. **主要任务**
5. **设计五子棋棋盘，采用19\*19的棋盘**
6. **设计下棋方式，黑白棋交替落下**
7. **设计胜利判定方式，落子后是否能凑成横或竖或斜的5个相同棋子连在一起，若能则连成5子的一方胜利，不能则继续下棋，直至棋盘满子和棋。**
8. **设计游戏一方胜利后，重新开始**
9. **项目设计**

#include <stdio.h>

#include <string.h>

#include <stdlib.h>

#define ROW 30

#define COL 36

#define MOVECOLOR 36

#define MOVECHAR '\*'

//初始化五子棋表格

void initbox(char p[][COL])

{

int i = 0, j = 0;

for (i = 0; i < ROW; i++)

{

for (j = 0; j < COL; j++)

{

p[i][j] = '+';

}

}

}

//打印显示五子棋表格

void show(char p[][COL])

{

int i = 0, j = 0;

for (i = 0; i < ROW; i++)

{

for (j = 0; j < COL; j++)

{

printf("%c ", p[i][j]);

}

putchar(10);

}

}

//将当前光标定位于指定的(x, y)处

void gotoxy(int x, int y)

{

printf("\033[%d;%dH", x, y);

}

//显示光标所在位置的坐标值(x, y)

void showxy(int x, int y)

{

int i = 0;

printf("\033[s");

gotoxy(ROW+1, COL-6);

for (i = 0; i < 14; i++)

{

printf(" ");

}

//printf("\033[K\033[10;10m");

printf("\033[14D");

printf("x = %d y = %d\n", x, y);

printf("\033[u");

}

//移动光标到要下棋点

void move(char rect[][COL], char \*buf, int \*x, int \*y, int player)

{

char ch = 0;

if (0 == player % 2)

{

ch = '@';

}

else

{

ch = '#';

}

//方向键控制区按键识别，并处理

if (buf[0] == 27 && buf[1] == 91)

{

switch (buf[2])

{

case 65:

if (\*x > 1 && \*x <= ROW) //上移处理

{

if (rect[\*x-1][\*y-1] == '+') //下棋点位置在移动时要判断该位置是否为空，为空则将空的颜色恢复黑色

printf("\033[10;10m+\033[D\033[0m");

printf("\033[A"); //上移

if (rect[\*x-2][\*y-1] == '+')

printf("\033[%d;10m%c\033[D\033[0m", MOVECOLOR, MOVECHAR); //将下棋点位置标明为特殊字符，以便于识别

\*x -= 1;

}

break;

case 66:

if (\*x >= 1 && \*x < ROW) //下移处理

{

if (rect[\*x-1][\*y-1] == '+')

printf("\033[10;10m+\033[D\033[0m");

printf("\033[B");

if (rect[\*x][\*y-1] == '+')

printf("\033[%d;10m%c\033[D\033[0m", MOVECOLOR, MOVECHAR);

\*x += 1;

}

break;

case 67:

if (\*y >= 1 && \*y < COL) //右移处理

{

if (rect[\*x-1][\*y-1] == '+')

printf("\033[10;10m+\033[D\033[0m");

printf("\033[2C");

if (rect[\*x-1][\*y] == '+')

printf("\033[%d;10m%c\033[D\033[0m", MOVECOLOR, MOVECHAR);

\*y += 1;

}

break;

case 68:

if (\*y > 1 && \*y <= COL) //左移处理

{

if (rect[\*x-1][\*y-1] == '+')

printf("\033[10;10m+\033[D\033[0m");

printf("\033[2D");

if (rect[\*x-1][\*y-2] == '+')

printf("\033[%d;10m%c\033[D\033[0m", MOVECOLOR, MOVECHAR);

\*y -= 1;

}

break;

default:

break;

}

}

//左侧控制键"w","s","a","d"识别，并处理

if (0 == buf[1])

{

switch (buf[0])

{

case 119:

if (\*x > 1 && \*x <= ROW) //上移处理

{

if (rect[\*x-1][\*y-1] == '+') //下棋点位置在移动时要判断该位置是否为空，为空则将空的颜色恢复

printf("\033[10;10m+\033[D\033[0m");

printf("\033[A"); //上移

if (rect[\*x-2][\*y-1] == '+')

printf("\033[%d;10m%c\033[D\033[0m", MOVECOLOR, MOVECHAR); //将下棋点位置标明为特殊字符，以便于识别

\*x -= 1;

}

break;

case 115:

if (\*x >= 1 && \*x < ROW) //下移处理

{

if (rect[\*x-1][\*y-1] == '+')

printf("\033[10;10m+\033[D\033[0m");

printf("\033[B");

if (rect[\*x][\*y-1] == '+')

printf("\033[%d;10m%c\033[D\033[0m", MOVECOLOR, MOVECHAR);

\*x += 1;

}

break;

case 100:

if (\*y >= 1 && \*y < COL) //右移处理

{

if (rect[\*x-1][\*y-1] == '+')

printf("\033[10;10m+\033[D\033[0m");

printf("\033[2C");

if (rect[\*x-1][\*y] == '+')

printf("\033[%d;10m%c\033[D\033[0m", MOVECOLOR, MOVECHAR);

\*y += 1;

}

break;

case 97:

if (\*y > 1 && \*y <= COL) //左移处理

{

if (rect[\*x-1][\*y-1] == '+')

printf("\033[10;10m+\033[D\033[0m");

printf("\033[2D");

if (rect[\*x-1][\*y-2] == '+')

printf("\033[%d;10m%c\033[D\033[0m", MOVECOLOR, MOVECHAR);

\*y -= 1;

}

break;

default:

break;

}

}

showxy(\*x, \*y);

}

void playerchk(int \*player)

{

if (0 == \*player % 2)

{

printf("\033[s");

gotoxy(ROW+1, 0);

printf("\033[K");

gotoxy(ROW+1, 2);

printf("\033[10;10mPlayerA\033[K\033[0m");

printf("\033[u");

}

else if (1 == \*player % 2)

{

printf("\033[s");

gotoxy(ROW+1, 0);

printf("\033[K");

gotoxy(ROW+1, 32);

printf("\033[10;10mPlayerB\033[K\033[0m");

printf("\033[u");

}

}

//检查是否有五个连续并且一样的字符，有则游戏结束

int resultchk(char rect[][COL])

{

int i = 0, j = 0, k = 0;

int count = 0;

char cha = '@';

char chb = '#';

char ch = 0;

//检查各行是否有五个连续字符

for (i = 0; i < ROW; i++)

{

for (j = 0; j < COL-4; j++)

{

if ((rect[i][j] != '+') && (rect[i][j] == rect[i][j+1]) && (rect[i][j] == rect[i][j+2]) && (rect[i][j] == rect[i][j+3]) && (rect[i][j] == rect[i][j+4]))

{

if (cha == rect[i][j])

{

ch = cha;

gotoxy (ROW+2, COL-11);

printf("Game over! PlayerA win!\n");

}

else if (chb == rect[i][j])

{

ch = chb;

gotoxy (ROW+2, COL-11);

printf("Game over! PlayerB win!\n");

}

for (k = 0; k < 5; k++)

{

gotoxy(i+1, (j+k+1) \* 2-1);

printf("\033[10;43m%c\033[0m", ch);

}

return 1;

}

}

}

//检查各列是否有五个连续字符

for (j = 0; j < ROW; j++)

{

for (i = 0; i < COL-4; i++)

{

if ((rect[i][j] != '+') && (rect[i][j] == rect[i+1][j]) && (rect[i][j] == rect[i+2][j]) && (rect[i][j] == rect[i+3][j]) && (rect[i][j] == rect[i+4][j]))

{

if (cha == rect[i][j])

{

ch = cha;

gotoxy (ROW+2, COL-11);

printf("Game over! PlayerA win!\n");

}

else if (chb == rect[i][j])

{

ch = chb;

gotoxy (ROW+2, COL-11);

printf("Game over! PlayerB win!\n");

}

for (k = 0; k < 5; k++)

{

gotoxy(i+k+1, (j+1) \* 2-1);

printf("\033[10;43m%c\033[0m", ch);

}

return 1;

}

}

}

//检查左上－右下斜线上是否有五个连续字符相同

for (i = 0; i < ROW-4; i++)

{

for (j = 0; j < COL-4; j++)

{

if ((rect[i][j] != '+') && (rect[i][j] == rect[i+1][j+1]) && (rect[i][j] == rect[i+2][j+2]) && (rect[i][j] == rect[i+3][j+3]) && (rect[i][j] == rect[i+4][j+4]))

{

if (cha == rect[i][j])

{

ch = cha;

gotoxy (ROW+2, COL-11);

printf("Game over! PlayerA win!\n");

}

else if ('#' == rect[i][j])

{

ch = chb;

gotoxy (ROW+2, COL-11);

printf("Game over! PlayerB win!\n");

}

for (k = 0; k < 5; k++)

{

gotoxy(i+k+1, (j+k+1) \* 2-1);

printf("\033[10;43m%c\033[0m", ch);

}

return 1;

}

}

}

//检查左下－右上斜线上是否有五个连续字符相同

for (i = 0; i < ROW-4; i++)

{

for (j = 4; j < COL; j++)

{

if ((rect[i][j] != '+') && (rect[i][j] == rect[i+1][j-1]) && (rect[i][j] == rect[i+2][j-2]) && (rect[i][j] == rect[i+3][j-3]) && (rect[i][j] == rect[i+4][j-4]))

{

if (cha == rect[i][j])

{

ch = cha;

gotoxy (ROW+2, COL-11);

printf("Game over! PlayerA win!\n");

}

else if (ch == rect[i][j])

{

ch = chb;

gotoxy (ROW+2, COL-11);

printf("Game over! PlayerB win!\n");

}

for (k = 0; k < 5; k++)

{

gotoxy(i+k+1, (j-k+1) \* 2-1);

printf("\033[10;43m%c\033[0m", ch);

}

return 1;

}

}

}

}

int main(void)

{

int i = 0, j = 0;

char rect[ROW][COL] = { 0 };

int ret = 0;

int x = ROW / 2, y = COL / 2;

int player = 0;

system("clear");

system("stty -echo");

system("stty -icanon");

initbox(rect);

show(rect);

printf("\033[s");

gotoxy(ROW+1, 2);

printf("\033[10;10mPlayerA(@)\033[K\033[0m");

printf("\033[u");

gotoxy(x, y \* 2 - 1);

showxy(x, y);

printf("\033[?25l");

if (rect[x-1][y-1] == '+')

{

printf("\033[%d;10m%c\033[D\033[0m", MOVECOLOR, MOVECHAR);

}

fflush(NULL);

while (1)

{

int i = 0;

char buf[10] = { 0 };

ret = read(0, buf, 10);

move(rect, buf, &x, &y, player);

//if (buf[0] == 119)

//for (i = 0; i < ret; i++)

//{

// printf("buf[%d] = %d\n", i, buf[i]);

//}

if (buf[0] == 32 && buf[1] == 0) //按下空格键，在当前位置放下棋子

{

if ((0 == player % 2) && (rect[x-1][y-1] == '+')) //玩家一回合内，按下空格，放置'@'

{

rect[x-1][y-1] = '@';

printf("\033[31;10m@\033[D\033[0m");

printf("\033[s");

gotoxy(ROW+1, 2);

printf("\033[K");

printf("\033[u");

showxy(x, y);

printf("\033[s");

gotoxy(ROW+1, COL \* 2 - 10);

printf("\033[K");

printf("\033[10;10mPlayerB(#)\033[K\033[0m");

printf("\033[u");

player++;

}

else if ((1 == player % 2) && (rect[x-1][y-1] == '+')) //玩家二回合内，按下空格，放置'#'

{

rect[x-1][y-1] = '#';

printf("\033[32;10m#\033[D\033[0m");

printf("\033[s");

gotoxy(ROW+1, 2);

printf("\033[K");

printf("\033[10;10mPlayerA(@)\033[K\033[0m");

printf("\033[u");

showxy(x, y);

player++;

}

}

if (buf[0] == 27 && buf[1] == 0) //按下ESC键退出游戏

{

if ('+' == rect[x-1][y-1])

printf("\033[10;10m+");

gotoxy(ROW+2, 0);

//show(rect);

break;

}

if (resultchk(rect) == 1)

{

break;

}

fflush(NULL);

}

gotoxy(ROW+3, 0);

printf("\033[?25h");

system("stty echo");

system("stty icanon");

return 0;

}

1. **工具**

**Visual C++6.0**