人工智能第三次实验算法：

五子棋小游戏：

源代码：

*#!/usr/bin/env python3  
#-\*- coding:utf-8 -\*-***import** pygame  
**from** pygame.locals **import** \*  
**from** sys **import** exit  
**import** numpy  
background\_image = **'qipan.png'**white\_image = **'white.png'**black\_image = **'black.png'  
  
def** WhoWin(x,y,darray):  
 num1,num2,num3,num4 = 0,0,0,0  
 *#判断上下左右左上右上左下右下8个方向* i = x-1  
 **while**(i>=0):  
 **if** darray[i][y] == 1:  
 num1+=1  
 i -= 1  
 **else**:  
 **break** i = x+1  
 **while** i<19:  
 **if** darray[i][y] == 1:  
 num1+=1  
 i += 1  
 **else**:  
 **break** j =y-1  
 **while** (j >= 0):  
 **if** darray[x][j] == 1:  
 num2 += 1  
 j -= 1  
 **else**:  
 **break** j = y + 1  
 **while** j < 19:  
 **if** darray[x][j] == 1:  
 num2 += 1  
 j += 1  
 **else**:  
 **break** i,j = x-1,y-1  
 **while**(i>=0 **and** j>=0):  
 **if** darray[i][j] == 1:  
 num3 += 1  
 i -= 1  
 j -= 1  
 **else** :  
 **break** i, j = x + 1, y + 1  
 **while** (i < 19 **and** j < 19):  
 **if** darray[i][j] == 1:  
 num3 += 1  
 i += 1  
 j += 1  
 **else**:  
 **break** i, j = x + 1, y - 1  
 **while** (i >= 0 **and** j >= 0):  
 **if** darray[i][j] == 1:  
 num4 += 1  
 i += 1  
 j -= 1  
 **else**:  
 **break** i, j = x - 1, y + 1  
 **while** (i < 19 **and** j < 19):  
 **if** darray[i][j] == 1:  
 num4 += 1  
 i -= 1  
 j += 1  
 **else**:  
 **break***#五子胜* **if** num1>=4 **or** num2>=4 **or** num3 >= 4 **or** num4 >= 4:  
 **return True  
 else**:  
 **return False***#初始化*pygame.init()  
*#屏幕、背景图、白黑子转换*screen = pygame.display.set\_mode((584, 584), RESIZABLE, 32)  
background = pygame.image.load(background\_image).convert()  
white = pygame.image.load(white\_image).convert\_alpha()  
black = pygame.image.load(black\_image).convert\_alpha()  
*#标题画图字体*screen.blit(background, (0,0))  
font = pygame.font.SysFont(**"arial"**, 40);  
pygame.display.set\_caption(**'五子棋'**)  
  
*#zeros()返回19行19列的数组*white\_luodian = numpy.zeros((19,19))  
black\_luodian = numpy.zeros((19,19))  
  
*#设置棋盘的所有点的坐标*qipan\_list = [(30+i\*29-12,30+j\*29-12) **for** i **in** range(19) **for** j **in** range(19)]  
*#默认黑子先手,转换下棋*transW\_B = **True***#游戏主循环***while True**:  
  
 **for** event **in** pygame.event.get():  
 **if** event.type == QUIT:  
 exit()  
 **if** event.type == MOUSEBUTTONDOWN:  
 x,y = pygame.mouse.get\_pos()  
 **if** 30 <= x <= 554 **and** 30 <= y <= 554 **and** ((x - 30) % 29 <= 12 **or** (x - 30) % 29 >= 17) **and** (  
 (y - 30) % 29 <= 12 **or** (y - 30) % 29 >= 17):  
 *#四舍五入* m = int(round((x-30)/29))  
 n = int(round((y-30)/29))  
 *#结果分析* **if** transW\_B:  
 transW\_B = **not** transW\_B  
 screen.blit(black, qipan\_list[19\*m+n])  
 black\_luodian[n][m] = 1  
 **if** WhoWin(n,m,black\_luodian):  
 screen.blit(font.render(**'Black chess player wins!'**, **True**, (0, 0, 0),(0,229,238)), (120, 280))  
  
 **else**:  
 transW\_B = **not** transW\_B  
 screen.blit(white, qipan\_list[19 \* m + n])  
 white\_luodian[n][m] = 1  
 **if** WhoWin(n,m,white\_luodian):  
 screen.blit(font.render(**'White chess player wins!'**, **True**, (255, 255, 255),(0,229,238)), (120, 280))  
  
 qipan\_list[19\*m+n] = **''** pygame.display.update()

运行结果：

