INTRODUCTION TO ALGORITHMS

CSPC21

ASSIGNMENT

Submitted by

Vidhya Lakshmi.B

106117107

CSE-A

TIC-TAC-TOE GAME

Greedy Method Application

#include<stdio.h>

#include<conio.h>

#include<stdlib.h>

#include <windows.h>

int board[10] = {2,2,2,2,2,2,2,2,2,2};

int turn = 1,flag = 0;

int player,comp;

void menu();

void go(int n);

void start\_game();

void check\_draw();

void draw\_board();

void player\_first();

void put\_X\_O(char ch,int pos);

COORD coord= {0,0}; // this is global variable

//center of axis is set to the top left cornor of the screen

void gotoxy(int x,int y)

{

coord.X=x;

coord.Y=y;

SetConsoleCursorPosition(GetStdHandle(STD\_OUTPUT\_HANDLE),coord);

}

void main()

{

system("cls");

menu();

getch();

}

void menu()

{

int choice;

system("cls");

printf("\n--------MENU--------");

printf("\n1 : Play with X");

printf("\n2 : Play with O");

printf("\n3 : Exit");

printf("\nEnter your choice:>");

scanf("%d",&choice);

turn = 1;

switch (choice)

{

case 1:

player = 1;

comp = 0;

player\_first();

break;

case 2:

player = 0;

comp = 1;

start\_game();

break;

case 3:

exit(1);

default:

menu();

}

}

int make2()

{

if(board[5] == 2)

return 5;

if(board[2] == 2)

return 2;

if(board[4] == 2)

return 4;

if(board[6] == 2)

return 6;

if(board[8] == 2)

return 8;

return 0;

}

int make4()

{

if(board[1] == 2)

return 1;

if(board[3] == 2)

return 3;

if(board[7] == 2)

return 7;

if(board[9] == 2)

return 9;

return 0;

}

int posswin(int p)

{

// p==1 then X p==0 then O

int i;

int check\_val,pos;

if(p == 1)

check\_val = 18;

else

check\_val = 50;

i = 1;

while(i<=9)//row check

{

if(board[i] \* board[i+1] \* board[i+2] == check\_val)

{

if(board[i] == 2)

return i;

if(board[i+1] == 2)

return i+1;

if(board[i+2] == 2)

return i+2;

}

i+=3;

}

i = 1;

while(i<=3)//column check

{

if(board[i] \* board[i+3] \* board[i+6] == check\_val)

{

if(board[i] == 2)

return i;

if(board[i+3] == 2)

return i+3;

if(board[i+6] == 2)

return i+6;

}

i++;

}

if(board[1] \* board[5] \* board[9] == check\_val)

{

if(board[1] == 2)

return 1;

if(board[5] == 2)

return 5;

if(board[9] == 2)

return 9;

}

if(board[3] \* board[5] \* board[7] == check\_val)

{

if(board[3] == 2)

return 3;

if(board[5] == 2)

return 5;

if(board[7] == 2)

return 7;

}

return 0;

}

void go(int n)

{

if(turn % 2)

board[n] = 3;

else

board[n] = 5;

turn++;

}

void player\_first()

{

int pos;

check\_draw();

draw\_board();

gotoxy(30,18);

printf("Your Turn :> ");

scanf("%d",&pos);

if(board[pos] != 2)

player\_first();

if(pos == posswin(player))

{

go(pos);

draw\_board();

gotoxy(30,20);

//textcolor(128+RED);

printf("Player Wins");

getch();

exit(0);

}

go(pos);

draw\_board();

start\_game();

}

void start\_game()

{

// p==1 then X p==0 then O

if(posswin(comp))

{

go(posswin(comp));

flag = 1;

}

else if(posswin(player))

go(posswin(player));

else if(make2())

go(make2());

else

go(make4());

draw\_board();

if(flag)

{

gotoxy(30,20);

//textcolor(128+RED);

printf("Computer wins");

getch();

}

else

player\_first();

}

void check\_draw()

{

if(turn > 9)

{

gotoxy(30,20);

//textcolor(128+RED);

printf("Game Draw");

getch();

exit(0);

}

}

void draw\_board()

{

int j;

for(j=9; j<17; j++)

{

gotoxy(35,j);

printf("| |");

}

gotoxy(28,11);

printf("-----------------------");

gotoxy(28,14);

printf("-----------------------");

for(j=1; j<10; j++)

{

if(board[j] == 3)

put\_X\_O('X',j);

else if(board[j] == 5)

put\_X\_O('O',j);

}

}

void put\_X\_O(char ch,int pos)

{

int m;

int x = 31, y = 10;

m = pos;

if(m > 3)

{

while(m > 3)

{

y += 3;

m -= 3;

}

}

if(pos % 3 == 0)

x += 16;

else

{

pos %= 3;

pos--;

while(pos)

{

x+=8;

pos--;

}

}

gotoxy(x,y);

printf("%c",ch);

}

OUTPUT

--------MENU--------

1 : Play with X

2 : Play with O

3 : Exit

Enter your choice:>2

| |

| |

-----------------------

| |

| X |

-----------------------

| |

| |

Your Turn :>

--------MENU--------

1 : Play with X

2 : Play with O

3 : Exit

Enter your choice:>2

| |

| O |

-----------------------

| |

X | X |

-----------------------

| |

| |

Your Turn :> 2

--------MENU--------

1 : Play with X

2 : Play with O

3 : Exit

Enter your choice:>2

| |

| O |

-----------------------

| |

X | X | O

-----------------------

| |

| X |

Your Turn :> 6

--------MENU--------

1 : Play with X

2 : Play with O

3 : Exit

Enter your choice:>2

| |

X | O | O

-----------------------

| |

X | X | O

-----------------------

| |

| X |

Your Turn :> 3

--------MENU--------

1 : Play with X

2 : Play with O

3 : Exit

Enter your choice:>2

| |

X | O | O

-----------------------

| |

X | X | O

-----------------------

| |

| X | O

Your Turn :> 9

Player Wins