**Assignment – 6**

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Ques- tic Tac Toe Game  
The working of tic tac toe game is same as traditional tic tac toe  
having following components:  
• Objective: To be the first to make a straight line with  
either ‘X’ or ‘O’.  
• Game Board: The board consists of a 3×3 matrix-like  
structure, having 9 small boxes.  
• The computer: Since it is a two-player game each player  
gets one chance alternatively. i.e.; first player1 than  
player2.  
• Moves: The computer starts the game with O. After that  
player makes moves alternatively.  
• Winning: You win by making your symbol in a row or  
diagonal or column. Also, as a part of strategy you need to  
block your opponent from forming a straight line while  
making of your own.

Sol:

#include <stdio.h>

void displayBoard(char board[3][3]) {

for (int i = 0; i < 3; i++) {

for (int j = 0; j < 3; j++) {

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

if (j < 2) printf("|");

}

printf("\n");

if (i < 2) printf("---------\n");

}

printf("\n");

}

int checkWinner(char board[3][3]) {

for (int i = 0; i < 3; i++) {

if ((board[i][0] == board[i][1] && board[i][1] == board[i][2] && board[i][0] != ' ') ||

(board[0][i] == board[1][i] && board[1][i] == board[2][i] && board[0][i] != ' ')) {

return 1;

}

}

if ((board[0][0] == board[1][1] && board[1][1] == board[2][2] && board[0][0] != ' ') ||

(board[0][2] == board[1][1] && board[1][1] == board[2][0] && board[0][2] != ' ')) {

return 1;

}

return 0;

}

int isBoardFull(char board[3][3]) {

for (int i = 0; i < 3; i++) {

for (int j = 0; j < 3; j++) {

if (board[i][j] == ' ') {

return 0;

}

}

}

return 1;

}

int makeMove(char board[3][3], int player, int row, int col) {

if (board[row][col] == ' ') {

board[row][col] = (player == 1) ? 'X' : 'O';

return 1;

}

return 0;

}

int main() {

char board[3][3] = {{' ', ' ', ' '}, {' ', ' ', ' '}, {' ', ' ', ' '}};

int row, col;

int player = 1;

int gameOver = 0;

printf("Welcome to Tic Tac Toe!\n");

while (!gameOver) {

displayBoard(board);

printf("Player %d (%c), enter your move (row and column): ", player, (player == 1) ? 'X' : 'O');

scanf("%d %d", &row, &col);

row--; col--;

if (!makeMove(board, player, row, col)) {

printf("Invalid move! Try again.\n");

continue;

}

if (checkWinner(board)) {

displayBoard(board);

printf("Player %d (%c) wins!\n", player, (player == 1) ? 'X' : 'O');

gameOver = 1;

}

else if (isBoardFull(board)) {

displayBoard(board);

printf("It's a draw!\n");

gameOver = 1;

}

player = (player == 1) ? 2 : 1;

}

return 0;

}