**Assignment – 6**

#include <stdio.h>

#include <stdbool.h>

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

bool makeMove(char board[3][3], int player, int position);

bool checkWin(char board[3][3]);

bool isDraw(char board[3][3]);

int main() {

    char board[3][3] = { {'1', '2', '3'}, {'4', '5', '6'}, {'7', '8', '9'} };

    int player = 1;

    int position;

    bool game\_over = false;

    printf("Player 1: X\nPlayer 2: O\n\n");

    while (!game\_over) {

        displayBoard(board);

        printf("Player %d, enter the position (1-9): ", player);

        scanf("%d", &position);

        if (!makeMove(board, player, position)) {

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

            continue;

        }

        if (checkWin(board)) {

            displayBoard(board);

            printf("Player %d wins! Congratulations!\n", player);

            game\_over = true;

        }

        else if (isDraw(board)) {

            displayBoard(board);

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

            game\_over = true;

        }

        else {

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

        }

    }

    return 0;

}

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

    printf("\n");

    for (int i = 0; i < 3; i++) {

        printf(" %c | %c | %c \n", board[i][0], board[i][1], board[i][2]);

        if (i < 2) {

            printf("\_\_\_|\_\_\_|\_\_\_\n");

        }

        else {

            printf("   |   |   \n");

        }

    }

    printf("\n");

}

bool makeMove(char board[3][3], int player, int position) {

    char mark = (player == 1) ? 'X' : 'O';

    int row = (position - 1) / 3;

    int col = (position - 1) % 3;

    if (position < 1 || position > 9 || board[row][col] == 'X' || board[row][col] == 'O') {

        return false;

    }

    board[row][col] = mark;

    return true;

}

bool checkWin(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[0][i] == board[1][i] && board[1][i] == board[2][i])) {

            return true;

        }

    }

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

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

        return true;

    }

    return false;

}

bool isDraw(char board[3][3]) {

    for (int i = 0; i < 3; i++) {

        for (int j = 0; j < 3; j++) {

            if (board[i][j] != 'X' && board[i][j] != 'O') {

                return false;

            }

        }

    }

    return true;

}