

Now we have to check that if anyone win or not. So we will create two new functions that will check if someone win or the match is drawn.

For winning we have to check that the row col or diagonal is same or not. First let's check row-

Row 0 

00	01	02
----	----	----

Row 1 

10	11	12
----	----	----

Row 2 

20	21	22
----	----	----

For this we can make a condition just like that -

`(board[i][0]==board[i][1]&&board[i][1]==board[i][2])`

If we enter the condition in a for loop it will check each row. If condition is true it will return true.

Now let's goto check column-

Col 0	Col 1	Col 2
00	01	02
10	11	12
20	21	22

For checking column we can apply a condition like this-

`(board[0][i]==board[1][i]&&board[1][i]==board[2][i])`

Also it will be applied by for loop.

Now by mixing all of these-

```
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;
    }
}
```

The diagonals are- 00 11 22 and 02 11 20

So the full function of winning check is-

```

bool check_win(){
    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;
}

```

Let's check if the match is draw or not. For that we also create a function. It is just a simple approach. The task is just to check every cell that it is all filled with X or O or not. For simplify it will check every cell and if it find atleast one cell that doesn't fill with X or O, it will return false. Otherwise after each checking it will give true. So, the full function is-

```

bool check_Draw(){
    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;
}

```

So, the 2 player Tic-Tac-Toe game is complete. For checking our functions work correctly we can run the following code-

```

#include<stdio.h>
#include<stdbool.h>
char board[3][3]={'1','2','3','4','5','6','7','8','9'};
void display_board(){
    for(int i=0; i<3; i++){
        for(int j=0; j<3; j++){
            printf(" %c ", board[i][j]); // There are one space beside each side of %c
            if(j<2){ printf("|");}
        }
    }
}

```

```

    printf("\n");
    if(i<2){printf("---|---|---\n"); }
}
}
void make_move(char play){
    int choice; bool valid=false;
    while(!valid){
        scanf("%d",&choice);
        if(choice>=1 && choice<=9){
            int r=(choice-1)/3;
            int c=(choice-1)%3;
            if(board[r][c]!='X' && board[r][c]!='O'){
                board[r][c]=play;
                valid=true;
            }else{
                printf("The cell is already taken. Try again!\n");
            }
        }else{
            printf("Invalid Input.Choose from 1 to 9\n");
        }
    }
}
bool check_win(){ //To check if a player has won or not
    for(int i=0; i<3; i++){
        //Checking column and row
        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;
        }
    }
    //Checking diagonal
    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 check_Draw(){//Check if the game is draw or not
    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;
}
int main(){
    display_board();
    int i=0;
    while(5){
        if(i%2==0){
            printf("Player 1st: Your Move:");
            make_move('X');
            display_board();
            //Checking winning or draw after each move
            if(check_win()){
                printf("1st Player, you have won!!\n");
                break; // After winning the loop will break and avoid infinite loop
            }
            if(check_Draw()){
                printf("The match is draw!\n");
                break; //After being draw the loop will break and avoid infinite loop
            }
        }else{
            printf("Player 2nd: Your Move:");
            make_move('O');
            display_board();
            //Checking winning or draw after each move
            if(check_win()){
                printf("2nd Player, you have won!!\n");
                break; // After winning the loop will break and avoid infinite loop
            }
            if(check_Draw()){
                printf("The match is draw!\n");
                break; //After being draw the loop will break and avoid infinite loop
            }
        }
        i++;
    }
    printf("Game Completed");
    return 0;
}

```

Output:

Win:

1	2	3
4	5	6
7	8	9

Player 1st: Your Move:2

1	X	3
4	5	6
7	8	9

Player 2nd: Your Move:5

1	X	3
4	0	6
7	8	9

Player 1st: Your Move:3

1	X	X
4	0	6
7	8	9

Player 2nd: Your Move:1

0	X	X
4	0	6
7	8	9

Player 2nd: Your Move:1

0	X	X
4	0	6
7	8	9

Player 1st: Your Move:6

0	X	X
4	0	X
7	8	9

Player 2nd: Your Move:9

0	X	X
4	0	X
7	8	0

2nd Player, you have won!!

Game Completed

Process returned 0 (0x0) execution time : 61.052 s

Press any key to continue.

Draw:

1   2   3 --- --- ---	X   0   3 --- --- ---
4   5   6 --- --- ---	0   X   6 --- --- ---
7   8   9 Player 1st: Your Move:7	X   8   9 Player 2nd: Your Move:3
1   2   3 --- --- ---	X   0   0 --- --- ---
4   5   6 --- --- ---	0   X   6 --- --- ---
X   8   9 Player 2nd: Your Move:2	X   8   9 Player 1st: Your Move:8
1   0   3 --- --- ---	X   0   0 --- --- ---
4   5   6 --- --- ---	0   X   6 --- --- ---
X   8   9 Player 1st: Your Move:1	X   X   9 Player 2nd: Your Move:9
X   0   3 --- --- ---	X   0   0 --- --- ---
4   5   6 --- --- ---	0   X   6 --- --- ---
X   8   9 Player 2nd: Your Move:4	X   X   0 Player 1st: Your Move:6
X   0   3 --- --- ---	X   0   0 --- --- ---
0   5   6 --- --- ---	0   X   X --- --- ---
X   8   9 Player 1st: Your Move:5	X   X   0 The match is draw!