



# 2D Arrays

## Tic Tac Toe



# Tic Tac Toe: Paper Pencil Game

There are two symbols that are used in this game: **X** and **O**, both of the players can choose either of them. They will take their turn to mark spaces in a **3x3 grid**. The player will win if he/she succeeds in marking three of his/her symbol in a row, column or diagonal.





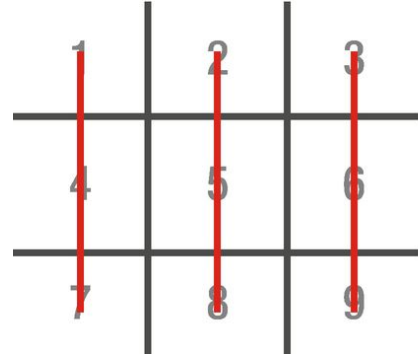


# Tic Tac Toe: checkRows

```
bool checkRows(char symbol){
    int count = 0;
    for(int row = 0; row < gridSize; row = row + 1)
    {
        count = 0;
        for(int col = 0; col < gridSize; col = col + 1)
        {
            if(board[row][col] == symbol){
                count = count + 1;
            }
        }
        if(count == gridSize)
        {
            return 1;
        }
    }
    return 0;
}
```

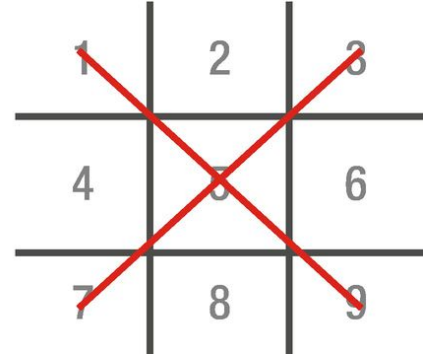
1	2	3
4	5	6
7	8	9

# Tic Tac Toe: checkColumns



```
bool checkColumns(char symbol){
    int count = 0;
    for(int col = 0; col < gridSize; col = col + 1)
    {
        count = 0;
        for(int row = 0; row < gridSize; row = row + 1)
        {
            if(board[row][col] == symbol){
                count = count + 1;
            }
        }
        if(count == gridSize)
        {
            return 1;
        }
    }
    return 0;
}
```

# Tic Tac Toe: checkDiagonals



```
bool checkDiagonals(char symbol){
    int count = 0;
    for (int idx = 0; idx < gridSize; idx = idx + 1){
        if (board[idx][idx] == symbol){
            count = count + 1;
        }
    }
    if (count == gridSize){
        return 1;
    }
    count = 0;
    for (int row = 0, col = 2; row < gridSize; row++, col--){
        if (board[row][col] == symbol){
            count = count + 1;
        }
    }
    if (count == gridSize){
        return 1;
    }
    return 0;
}
```

# Tic Tac Toe: isWinner



Let's make a function that checks who is the winner.

```
bool isWinner(char symbol)
{
    if(checkRows(symbol) || checkColumns(symbol) || checkDiagonals(symbol))
    {
        return 1;
    }
    else
    {
        return 0;
    }
}
```



# Important: Self Assessment

The task at next slide is very much important for your video profile. The video profile is a video with high voice quality that explains your expertise and achievements that you have done within the programming fundamental course.

This video carries a marks toward final weightage and very important for A+, A and A-

# Self Assessment

Then keep on showing the board configuration to the Players and keep taking input from the **player 1** and **player 2** alternatively by asking to press a specific number from the board configuration. At the end, show who is the **winner**.

Give an option to user to save board configuration in file. When your game start it will ask to load configuration from file or **create new blank board**.

