

## Tic-Tac-Toe

### 1. Global Variables:

- **board**: a 3x3 array of characters which is initialized to the characters '1', '2', '3', ..., '9'.
- **player1**: a string to hold the name of the first player
- **player2**: a string to hold the name of the second player

### 2. Subprograms:

- **initialise()**: reads player names and stores them in variables **player1** and **player2** and then displays a message indicating that **player1** plays with 'O' and **player2** plays with token 'X'.

```
===== TIC-TAC-TOE GAME =====
Enter player names
Player 1: Janny
Player 2: Jenny
Janny plays with token X
Jenny plays with token O
```

- **displayBoard(b)**: displays a 3x3 array of characters **b**, 3 items per line.

```
===== TIC-TAC-TOE GAME =====
+-----+
| 1 | 2 | 3 |
|---|---|---|
| 4 | 5 | 6 |
|---|---|---|
| 7 | 8 | 9 |
+-----+
```

- **setMove(b, pos, tok)**: accepts a player's move, **pos**, and their token, **tok**, and then places their token in their chosen position. Use the **case** (multi-way selection) selection structure. Returns 1 if it is a valid move. Otherwise, prompts user to enter a move again.

```
===== TIC-TAC-TOE GAME =====
+-----+
| 1 | 2 | 3 |
|---|---|---|
| 4 | 5 | 6 |
|---|---|---|
| 7 | 8 | 9 |
+-----+
Janny's move: 5_
```

```
===== TIC-TAC-TOE GAME =====
+-----+
| 1 | 2 | 3 |
|---|---|---|
| 4 | X | 6 |
|---|---|---|
| 7 | 8 | 9 |
+-----+
Jenny's move: 5_
```

```
===== TIC-TAC-TOE GAME =====
+-----+
| 1 | 2 | 3 |
|---|---|---|
| 4 | X | 6 |
|---|---|---|
| 7 | 8 | 9 |
+-----+
Invalid move!
Jenny's move: _
```

**Hint:**

```

Case (pos)
  Case 1: if (b[0][0] = '1')
    b[0][0] = tok
    return 1
  endif
  Case 2: if (b[0][0] = '2')
    b[0][0] = tok
    return 1
  endif
  .
  .
  .
  Otherwise: print("Invalid Move")
    return 0
endCase

```

- **checkWin(b)**: checks every row and every column of the 3x3 character array **b** if they contain the same token. If they do, assign the token to a variable **won**.

For example, for row 1:

```

if (b[0][0] = b[0][1] and b[0][1] = b[0][2])
  won ← b[0][0]
endif

```

- **playGame()**:
  - Iterates players and prompts each player to make a move.
  - Gets a player's move and then passes it to setMove() accordingly.
  - Calls displayBoard() and checkWin() according after each player's move.
  - Repeat the above steps until one player wins or there are no more moves to make.