Tic-Tac-Toe Part 3

Contents

Time required: 90 minutes

Tic-Tac-Toe

A classic programming problem.

Videos

If you are having trouble with this assignment, or want to see another solution:

- Tic-Tac-Toe Part 1 in Matlab
- Tic-Tac-Toe Part 2 in Matlab

Check if Current Player Wins

Create a function called **isWinner()** which takes the board and the current player's number as a parameter. It returns true or false.

Computers can't "see" like we do. It has to check all possible combinations each time. Rows, columns and diagonals.

If any of these conditions is true, the current player wins.

Check Rows and Columns

In MATLAB, the **all** function checks if **all** elements of an array satisfy a specific condition.

- all(matrix, dim) operates along the specified dimension:
    - dim = 1: Checks each column (returns a row vector of results).
    - dim = 2: Checks each row (returns a column vector of results).

in MATLAB, the **any** function checks if **any element** of an array satisfies a specific condition.

- **For a matrix**: any(matrix, dim) operates along the specified dimension:
    - dim = 1: Checks each column (returns a row vector of results).
    - dim = 2: Checks each row (returns a column vector of results).

Check Diagonals

Main diagonal

- The **diag()** function looks through the board for one diagonal.
- The **all()** function looks for a match.

Secondary diagonal

- **flipud()** flips the board to check the other diagonal.
- The **diag()** function looks through the board for one diagonal.
- The **all()** function looks for a match.

Example run:

```
Do you want to play a game?
Let's play Tic Tac Toe
Can you beat the computer?
     0     0     0
     0     0     0
     0     0     0

Enter your move (1-9) (0 to exit): 1
Computer moves:
     1     0     0
     0     0     0
     0     2     0

Enter your move (1-9) (0 to exit): 2
Computer moves:
     1     1     0
     0     0     0
     0     2     2

Enter your move (1-9) (0 to exit): 3
Congratulations! You win!
```

Assignment Submission

1. Submit properly named and commented script files.
2. Attach a screenshot of the Command Window showing the successful execution of each script.
3. Attach all to the assignment in Blackboard.