

# Tic-Tac-Toe

## How a Simple Game Uses the OS

Staring Abel Reyes

# What the program does?

- Prints a 3x3 Tic-Tac-Toe board
- Lets two players take turns
- Checks for a winner after each move
- Ends when someone wins or when the board is full





# What are some main functions

## `print_board(board)`

Its job is only to show the board to the players, so it helps separate the display part of the program from the game logic.

## `check_winner(board)`

This function checks whether a player has won the game. It looks at each row, each column, and both diagonals to see if the same symbol appears three times in a row.

## `tic_tac_toe()`

This is the main function that controls the whole game. It creates the empty board, keeps track of the current player, asks for input, updates the board, and checks for a winner.



# How does it involved with OS



- The OS runs the Python interpreter as a process

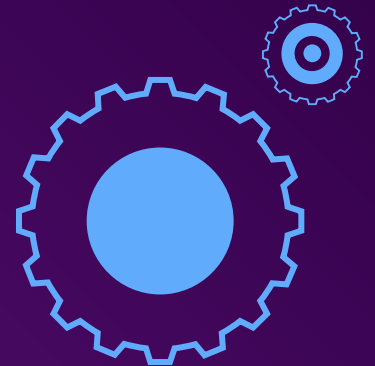
When the script is executed, the operating system creates a process for the Python interpreter. Process CPU time, tracks its state, and manages its execution.

- The OS provides access to terminal output

The `print()` function writes to standard output. The OS manages this output stream and sends the text to the terminal so the user can see the board and game messages.

- The OS allocates memory for variables like `board`, `current_player`, and `moves`

The process receives memory from the OS while it is running.



Project

For Fun ~/PycharmProjects/For Fun

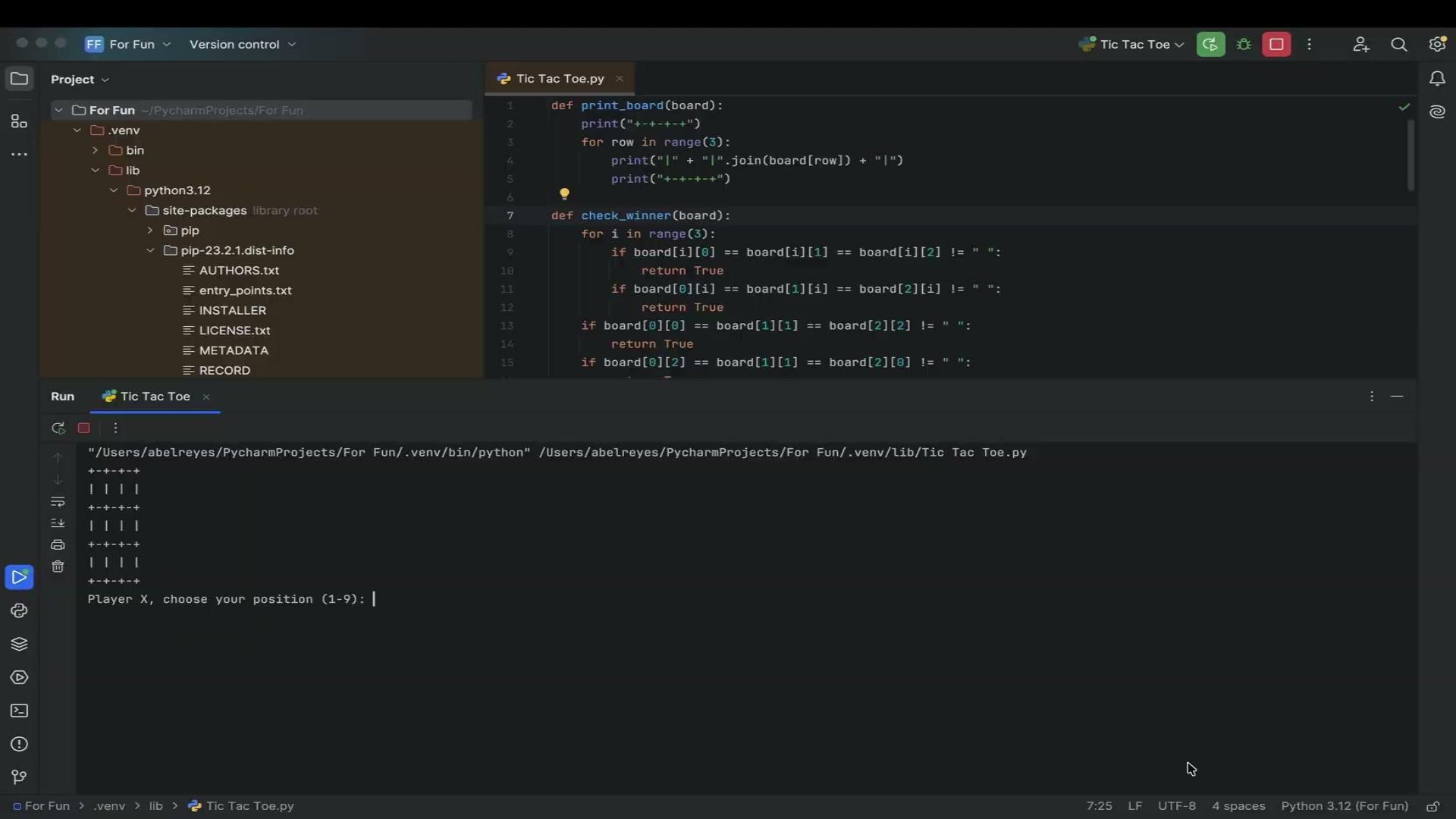
- .venv
  - bin
  - lib
    - python3.12
      - site-packages library root
        - pip
          - pip-23.2.1.dist-info
            - AUTHORS.txt
            - entry\_points.txt
            - INSTALLER
            - LICENSE.txt
            - METADATA
            - RECORD
            - top\_level.txt
            - WHEEL
            - \_virtualenv.pth
            - \_virtualenv.py
            - pip-23.2.1.virtualenv
          - CSC140
          - Tic Tac Toe.py
        - .gitignore
        - pyenv.cfg

External Libraries

Scratches and Consoles

Tic Tac Toe.py

```
1 def print_board(board):
2     print("+---+---+")
3     for row in range(3):
4         print("|" + "|" .join(board[row]) + "|")
5     print("+---+---+")
6
7 def check_winner(board):
8     for i in range(3):
9         if board[i][0] == board[i][1] == board[i][2] != " ":
10            return True
11         if board[0][i] == board[1][i] == board[2][i] != " ":
12            return True
13         if board[0][0] == board[1][1] == board[2][2] != " ":
14            return True
15         if board[0][2] == board[1][1] == board[2][0] != " ":
16            return True
17     return False
18
19 def tic_tac_toe():
20     board = [{" " for _ in range(3)] for _ in range(3)]
21     current_player = "X"
22     moves = 0
23
24     while moves < 9:
25         print_board(board)
26         try:
27             position = int(input(f"Player {current_player}, choose your position (1-9): ")) - 1
28             row, col = divmod(position, 3)
29
30             if board[row][col] == " ":
31                 board[row][col] = current_player
32                 moves += 1
33
34             if check_winner(board):
35                 print_board(board)
36                 print(f"Player {current_player} wins! 🎉")
37                 return
38
```



Tic Tac Toe.py

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14            return True
15        if board[0][2] == board[1][1] == board[2][0] != " ":
```

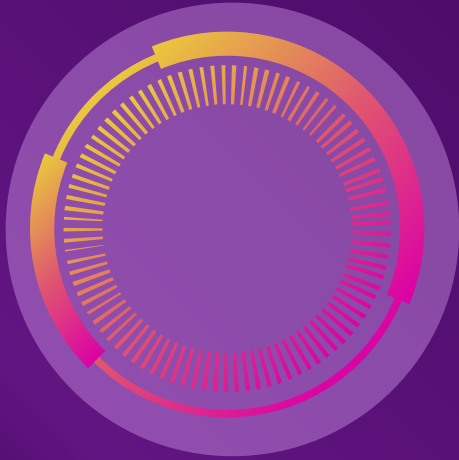
Run Tic Tac Toe



"/Users/abelreyes/PycharmProjects/For Fun/.venv/bin/python" /Users/abelreyes/PycharmProjects/For Fun/.venv/lib/Tic Tac Toe.py

```
+---+
| | |
+---+
| | |
+---+
| | |
+---+
| | |
+---+
```

Player X, choose your position (1-9): |



Thank  
You

