Artificial Intelligence Lab
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Q1) Write a program to implement tic tae toe problem in python

```python
def print_board(board):
    for row in board:
        print(" | ".join(row))
        print("-" * 5)

def check_winner(board):
    # Check rows
    for row in board:
        if row[0] == row[1] == row[2] and row[0] != ' ':
            return True, row[0]

    # Check columns
    for col in range(3):
        if board[0][col] == board[1][col] == board[2][col] and
            board[0][col] != ' ':
            return True, board[0][col]

    # Check diagonals
    if board[0][0] == board[1][1] == board[2][2] and board[0][0] != ' ':
        return True, board[0][0]
    if board[0][2] == board[1][1] == board[2][0] and board[0][2] != ' ':
        return True, board[0][2]

    return False, None

def is_board_full(board):
    for row in board:
        for cell in row:
```

```python
26     for row in board:
27         for cell in row:
28             if cell == ' ':
29                 return False
30     return True
31
32 def main():
33     board = [[' ' for _ in range(3)] for _ in range(3)]
34     current_player = 'X'
35
36     print("Welcome to Tic-Tac-Toe!")
37     print_board(board)
38
39     while True:
40         row = int(input(f"Player {current_player}, enter row (0, 1, or 2):
               "))
41         col = int(input(f"Player {current_player}, enter column (0, 1, or 2
               ): "))
42
43         if board[row][col] != ' ':
44             print("That cell is already taken. Try again.")
45             continue
46
47         board[row][col] = current_player
48         print_board(board)
49
50         winner_found, winner = check_winner(board)
51         if winner found:
```

```python
        winner_found, winner = check_winner(board)
        if winner_found:
            print(f"Player {winner} wins!")
            break
        elif is_board_full(board):
            print("It's a tie!")
            break

        # Switch players
        if current_player == 'X':
            current_player = 'O'
        else:
            current_player = 'X'

if __name__ == "__main__":
    main()
```

Output

```
Welcome to Tic-Tac-Toe!
  |   |
-----
  |   |
-----
  |   |
-----
Player X, enter row (0, 1, or 2): 0
Player X, enter column (0, 1, or 2): 0
X |   |
-----
  |   |
-----
  |   |
-----
Player O, enter row (0, 1, or 2): 2
Player O, enter column (0, 1, or 2): 2
X |   |
-----
  |   |
-----
  |   | O
-----
Player X, enter row (0, 1, or 2): 1
Player X, enter column (0, 1, or 2): 1
X |   |
-----
  | X |
```