PRACTICAL 1

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Que : Write a program to solve Tic-Tac-Toe without implementation of any specific AI algorithm.

Code:

```
import random


class TicTacToe:


    def __init__(self):
        self.board = []


    def create_board(self):
        for i in range(3):
            row = []
            for j in range(3):
                row.append('-')
            self.board.append(row)


    def get_random_first_player(self):
        return random.randint(0, 1)


    def fix_spot(self, row, col, player):
        self.board[row][col] = player


    def is_player_win(self, player):
        win = None
```

```
n = len(self.board)

# checking rows
for i in range(n):
    win = True
    for j in range(n):
        if self.board[i][j] != player:
            win = False
            break
    if win:
        return win

# checking columns
for i in range(n):
    win = True
    for j in range(n):
        if self.board[j][i] != player:
            win = False
            break
    if win:
        return win

# checking diagonals
win = True
for i in range(n):
    if self.board[i][i] != player:
        win = False
        break
if win:
    return win
```

```
        win = True
        for i in range(n):
            if self.board[i][n - 1 - i] != player:
                win = False
                break
        if win:
            return win
        return False

        for row in self.board:
            for item in row:
                if item == '-':
                    return False
        return True

    def is_board_filled(self):
        for row in self.board:
            for item in row:
                if item == '-':
                    return False
        return True

    def swap_player_turn(self, player):
        return 'X' if player == 'O' else 'O'

    def show_board(self):
        for row in self.board:
            for item in row:
                print(item, end=" ")
            print()
```

```
def start(self):
    self.create_board()

    player = 'X' if self.get_random_first_player() == 1 else 'O'
    while True:
        print(f"Player {player} turn")

        self.show_board()

        # taking user input
        row, col = list(
            map(int, input("Enter row and column numbers to fix spot: ").split()))
        print()

        # fixing the spot
        self.fix_spot(row - 1, col - 1, player)

        # checking whether current player is won or not
        if self.is_player_win(player):
            print(f"Player {player} wins the game!")
            break

        # checking whether the game is draw or not
        if self.is_board_filled():
            print("Match Draw!")
            break

        # swapping the turn
        player = self.swap_player_turn(player)
```

```
    # showing the final view of board
    print()
    self.show_board()


# starting the game
tic_tac_toe = TicTacToe()
tic_tac_toe.start()
```

Output:

```
Player X turn
- - -
- - -
- - -
Enter row and column numbers to fix spot: 3 2

Player O turn
- - -
- - -
- X -
Enter row and column numbers to fix spot: 1 3

Player X turn
- - O
- - -
- X -
Enter row and column numbers to fix spot: 1 1

Player O turn
X - O
- - -
- X -
Enter row and column numbers to fix spot: 2 3

Player X turn
X - O
- - O
- X -
Enter row and column numbers to fix spot: 3 3

Player O turn
X - O
- - O
- X X
Enter row and column numbers to fix spot: 2 2

Player X turn
X - O
- O O
```

```
- X X
Enter row and column numbers to fix spot: 3 1

Player X wins the game!

X - O
- O O
X X X
```

```
Player O turn
- - -
- - -
- - -
Enter row and column numbers to fix spot: 1 3

Player X turn
- - O
- - -
- - -
Enter row and column numbers to fix spot: 2 2

Player O turn
- - O
- X -
- - -
Enter row and column numbers to fix spot: 1 1

Player X turn
O - O
- X -
- - -
Enter row and column numbers to fix spot: 1 2

Player O turn
O X O
- X -
- - -
Enter row and column numbers to fix spot: 3 2

Player X turn
O X O
- X -
- O -
Enter row and column numbers to fix spot: 2 3

Player O turn
O X O
- X X
- O -
Enter row and column numbers to fix spot: 2 1

Player X turn
O X O
O X X
- O -
```

```
Enter row and column numbers to fix spot: 3 1

Player O turn
O X O
O X X
X O -
Enter row and column numbers to fix spot: 3 3

Match Draw!

O X O
O X X
X O O
```