

EXPERIMENT-21

Name: S.G.DEVSACHIN

Reg.No: 192111088

Course: CSA1789 Artificial Intelligence

Q) Write the python program for Tic Tac Toe game

Program:

```
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:

```

IDLE Shell 3.10.5
Python 3.10.5 (tags/v3.10.5:f377153, Jun 6 2022, 16:14:13) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> RESTART: E:/College/Al/tic tac toe.py
Player X turn
---
---
---
Enter row and column numbers to fix spot: 1 3
Player O turn
-- X
---
---
Enter row and column numbers to fix spot: 2 2
Player X turn
-- X
-- O -
---
Enter row and column numbers to fix spot: 1 1
Player O turn
X - X
- O -
---
Enter row and column numbers to fix spot: 1 2
Player X turn
X O X
- O -
---
Enter row and column numbers to fix spot: 3 2
Player O turn
X O X

```

```

IDLE Shell 3.10.5
File Edit Shell Debug Options Window Help
Player X turn
X O X
- O -
---
Enter row and column numbers to fix spot: 3 2

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

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

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

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

Match Draw!

X O X
O O X
X X O
>>>
Ln 64 Col 0
```