

Tutorial-1

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Subject: Artificial Intelligence

Topic: Tic-Tac-Toe Game

- TicTacToe1.py

```
import random

wining_positions = [[0, 1, 2], [3, 4, 5], [6, 7, 8], # All winning Combinations
                    [0, 3, 6], [1, 4, 7], [2, 5, 8],
                    [0, 4, 8], [2, 4, 6]]

def playerMove(game_position, available):
    move = int(input("Enter your Move :"))
    if move in available:
        game_position[move] = "X"
        available.remove(move)
    else:
        print("Enter a valid Move!!")
        playerMove(game_position, available)

def computerMove(game_position, available):
    move = random.choice(list(available))
    game_position[move] = "O"
    print("Computer puts circle at {}".format(move))
    available.remove(move)

def checkWinner(game_position, turn):
    for wining_position in wining_positions:
        if turn:
            if game_position[wining_position[0]] == "X"
            and game_position[wining_position[1]] == "X"
            and game_position[wining_position[2]] == "X":
                return "Player"
        else:
            if game_position[wining_position[0]] == "O"
            and game_position[wining_position[1]] == "O"
            and game_position[wining_position[2]] == "O":
                return "Computer"

def printGame(game_position):
    print()
    print(game_position[0:3])
    print(game_position[3:6])
    print(game_position[6:9])
    print()
```

```
def startGame():
    game_position = ["_", "_", "_", "_", "_", "_", "_", "_", "_", "_"] # Shows the current game state
    available = set([0, 1, 2, 3, 4, 5, 6, 7, 8]) # Shows available valid moves
    game_over = False # True if game is over or if we run out of moves
    turn = True # True For player, False for Computer
    winner = None

    while not game_over:
        if turn:
            playerMove(game_position, available)
            winner = checkWinner(game_position, turn)
            turn = False
        else:
            computerMove(game_position, available)
            winner = checkWinner(game_position, turn)
            turn = True

    printGame(game_position)

    if winner == "Player":
        print("{} Won!!".format(winner))
        break

    if len(available) == 0:
        print("Match Draw!!")
        break

    if winner == "Computer":
        print("{} Won!!".format(winner))
        break

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

- Output

```
C:\Windows\system32\cmd.exe
E:\College\Python>python TicTacToe.py
Enter your Move :7

['_', '_', '_']
['_', '_', '_']
['_', 'X', '_']

Computer puts circle at 6

['_', '_', '_']
['_', '_', '_']
['0', 'X', '_']

Enter your Move :4

['_', '_', '_']
['_', 'X', '_']
['0', 'X', '_']

Computer puts circle at 2

['_', '_', '0']
['_', 'X', '_']
['0', 'X', '_']

Enter your Move :3

['_', '_', '0']
['X', 'X', '_']
['0', 'X', '_']

Computer puts circle at 8

['_', '_', '0']
['X', 'X', '_']
['0', 'X', '0']
```

```
C:\Windows\system32\cmd.exe
```

```
Enter your Move :4
```

```
['_', '_', '_']  
['_', 'X', '_']  
['0', 'X', '_']
```

```
Computer puts circle at 2
```

```
['_', '_', '0']  
['_', 'X', '_']  
['0', 'X', '_']
```

```
Enter your Move :3
```

```
['_', '_', '0']  
['X', 'X', '_']  
['0', 'X', '_']
```

```
Computer puts circle at 8
```

```
['_', '_', '0']  
['X', 'X', '_']  
['0', 'X', '0']
```

```
Enter your Move :1
```

```
['_', 'X', '0']  
['X', 'X', '_']  
['0', 'X', '0']
```

```
Player Won!!
```

```
E:\College\Python>_
```