



Bansilal Ramnath Agarwal Charitable Trust's  
Vishwakarma Institute of Information  
Technology

**Department of  
Artificial Intelligence and Data Science**

**Name:** Soham Wadekar

**Class:** TY

**Division:** C

**Roll No:** 373063

**Semester:** 5

**Academic Year:** 2023-24

**Subject Name & Code:** Artificial Intelligence ADUA31201

**Title of Assignment:** Write a program for Automatic Nought and Crosses using random number

**Date of Performance:** 19/08/2023

**Date of Submission:** 24/08/2023

## Assignment – 1

# Code:

```
[13] ✓ 0.0s Python
```

```
# Importing necessary libraries
import random
```

```
[14] ✓ 0.0s Python
```

```
# Helper Functions
def print_board(board):
    for row in board:
        print(" | ".join(row))
        print("-" * 9)

def check_winner(board, player):
    for row in board:
        if all(cell == player for cell in row):
            return True

    for col in range(3):
        if all(board[row][col] == player for row in range(3)):
            return True

    if all(board[i][i] == player for i in range(3)) or all(board[i][2 - i] == player for i in range(3)):
        return True

    return False

def is_board_full(board):
    return all(cell != " " for row in board for cell in row)

def make_random_move(board, player):
    empty_cells = [(row, col) for row in range(3) for col in range(3) if board[row][col] == " "]
    if empty_cells:
        row, col = random.choice(empty_cells)
        board[row][col] = player
```

```
[15] ✓ 0.0s Python
```

```
# Main Function of the Game
def tic_tac_toe():
    board = [" " for _ in range(3)] for _ in range(3)]
    players = ["X", "O"]

    print("Welcome to Noughts and Crosses!")
    print_board(board)

    while True:
        for player in players:
            print(f"Player {player}'s turn:")

            if player == "X":
                row = int(input("Enter row (0, 1, or 2): "))
                col = int(input("Enter column (0, 1, or 2): "))
            else:
                make_random_move(board, player)
                row, col = None, None
            print_board(board)

            if row is not None and col is not None and 0 <= row < 3 and 0 <= col < 3 and board[row][col] == " ":
                board[row][col] = player
                print_board(board)

                if check_winner(board, player):
                    print(f"Player {player} wins!")
                    return

                if is_board_full(board):
                    print("It's a draw!")
                    return
```

```
[16] ✓ 25.8s Python
```

```
tic_tac_toe()
```

# Output:

```
... Welcome to Noughts and Crosses!
  | |
  -----
  | |
  -----
  | |
  -----
Player X's turn:
  | |
  -----
  | x |
  -----
  | |
  -----
Player O's turn:
  | |
  -----
  | x |
  -----
  | | 0
  -----
Player X's turn:
  | |
  -----
  | x |
  -----
X | | 0
  -----
Player O's turn:
0 | |
  -----
  | x |
  -----
X | | 0
  -----
Player X's turn:
0 | | x
  -----
  | x |
  -----
X | | 0
  -----
Player X wins!
```