



Program : Perfect information game - TIC TAC TOE

```
1. import random

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

def check_winner(board, player):
    # Check rows, columns, and diagonals for a win
    for i in range(3):
        if all(board[i][j] == player for j in range(3)) or
all(board[j][i] == player for j 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_full(board):
    return all(cell != " " for row in board for cell in row)

def ai_move(board):
    # Basic AI: Choose a random empty cell
    empty_cells = [(i, j) for i in range(3) for j in range(3) if
board[i][j] == " "]
    return random.choice(empty_cells)

def play_tic_tac_toe():
    board = [" " for _ in range(3)] for _ in range(3)]
    current_player = "X"
```



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```
while True:
    print_board(board)

    if current_player == "X":
        row, col = map(int, input(f"Player {current_player},
enter your move (row and column): ").split())
    else:
        print(f"AI ({current_player}) is making a move...")
        row, col = ai_move(board)
        print(f"AI chooses row {row} and column {col}")

    if board[row][col] != " ":
        print("Invalid move. Cell already occupied. Try
again.")
        continue

    board[row][col] = current_player

    if check_winner(board, current_player):
        print_board(board)
        if current_player == "X":
            print(f"Player {current_player} wins!
Congratulations!")
        else:
            print(f"AI ({current_player}) wins! Better luck
next time.")
        break

    if is_full(board):
        print_board(board)
        print("It's a draw! Nobody wins.")
        break
```



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```
current_player = "O" if current_player == "X" else "X"

if __name__ == "__main__":
    print("Welcome to Tic-Tac-Toe!")
    play_tic_tac_toe()
```

Output

```
Welcome to Tic-Tac-Toe!
| |
-----
| |
-----
| |
-----
Player X, enter your move (row and column): 0 0
X | |
-----
| |
-----
| |
-----
AI (O) is making a move...
AI chooses row 2 and column 0
X | |
-----
| |
-----
O | |
-----
Player X, enter your move (row and column): 0 2
X | | X
-----
| |
-----
O | |
-----
```

```
Player X, enter your move (row and column): 0 2
X | | X
-----
| |
-----
O | |
-----
AI (O) is making a move...
AI chooses row 1 and column 1
X | | X
-----
| O |
-----
O | |
-----
Player X, enter your move (row and column): 0 1
X | X | X
-----
| O |
-----
O | |
-----
Player X wins! Congratulations!
```