

# tictactoe

November 9, 2024

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[3]: # TICTACTOE
print("Name: Vismay Pawar N", "USN: 1BM22CS291", sep="\n")

board = {1: ' ', 2: ' ', 3: ' ',
         4: ' ', 5: ' ', 6: ' ',
         7: ' ', 8: ' ', 9: ' '}

def printBoard(board):
    print(board[1] + ' | ' + board[2] + ' | ' + board[3])
    print('---')
    print(board[4] + ' | ' + board[5] + ' | ' + board[6])
    print('---')
    print(board[7] + ' | ' + board[8] + ' | ' + board[9])
    print('\n')

def spaceFree(pos):
    return board[pos] == ' '

def checkWin():
    win_conditions = [(1, 2, 3), (4, 5, 6), (7, 8, 9), (1, 4, 7),
                      (2, 5, 8), (3, 6, 9), (1, 5, 9), (3, 5, 7)]
    for x, y, z in win_conditions:
        if board[x] == board[y] == board[z] != ' ':
            return True
    return False

def checkDraw():
    return all(board[key] != ' ' for key in board)

def insertLetter(letter, position):
    if spaceFree(position):
        board[position] = letter
        printBoard(board)

        if checkWin():
            print(f'{letter} wins!')
            return True
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        elif checkDraw():
            print('Draw!')
            return True
    else:
        print('Position taken, please pick a different position.')
    return False

player = 'O'
bot = 'X'

def playerMove():
    position = int(input('Enter position for O: '))
    while not spaceFree(position):
        position = int(input('Position taken. Enter a new position for O: '))
    return insertLetter(player, position)

def compMove():
    bestScore = -1000
    bestMove = 0
    for key in board.keys():
        if spaceFree(key):
            board[key] = bot
            score = minimax(board, False)
            board[key] = ' '
            if score > bestScore:
                bestScore = score
                bestMove = key
    return insertLetter(bot, bestMove)

def minimax(board, isMaximizing):
    if checkWin():
        return 1 if not isMaximizing else -1
    elif checkDraw():
        return 0

    if isMaximizing:
        bestScore = -1000
        for key in board.keys():
            if spaceFree(key):
                board[key] = bot
                score = minimax(board, False)
                board[key] = ' '
                bestScore = max(score, bestScore)
        return bestScore
    else:
        bestScore = 1000
        for key in board.keys():

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        if spaceFree(key):
            board[key] = player
            score = minimax(board, True)
            board[key] = ' '
            bestScore = min(score, bestScore)
    return bestScore

printBoard(board)
gameOver = False
while not gameOver:
    gameOver = compMove() or playerMove()

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Name: Vismay pawar N

USN: 1BM22CS331

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| |
-+-+
| |
-+-+
| |

```

```

X| |
-+-+
| |
-+-+
| |

```

Enter position for 0: 5

```

X| |
-+-+
|0|
-+-+
| |

```

```

X|X|
-+-+
|0|
-+-+
| |

```

Enter position for 0: 3

```

X|X|0
-+-+
|0|

```

```

-+-+-
| |

```

```

X|X|O
-+-+-
|O|
-+-+-
X| |

```

```

Enter position for O: 4
X|X|O
-+-+-
O|O|
-+-+-
X| |

```

```

X|X|O
-+-+-
O|O|X
-+-+-
X| |

```

```

Enter position for O: 8
X|X|O
-+-+-
O|O|X
-+-+-
X|O|

```

```

X|X|O
-+-+-
O|O|X
-+-+-
X|O|X

```

Draw!