AI LAB

EXERCISE 1 - IMPLEMENTATION OF TOY PROBLEM

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ALGORITHM:

STEP 1: Firstly, we have created blank 3×3 board.

STEP 2: Then assigned a function game() for game play.

STEP 3: Then assigned positions 1 to 9 using if-else statement.

STEP 4: Then created a variable ‘restart’ for restart the game.

STEP 5: Finally, we are ready to begin the game.

CODE:

```
#TIC TAC TOE
theBoard = {'7': ' ' , '8': ' ' , '9': ' ' ,
        '4': ' ' , '5': ' ' , '6': ' ' ,
        '1': ' ' , '2': ' ' , '3': ' ' }

board_keys = []

for key in theBoard:
   board_keys.append(key)
def printBoard(board):
   print(board['7'] + '|' + board['8'] + '|' + board['9'])
```

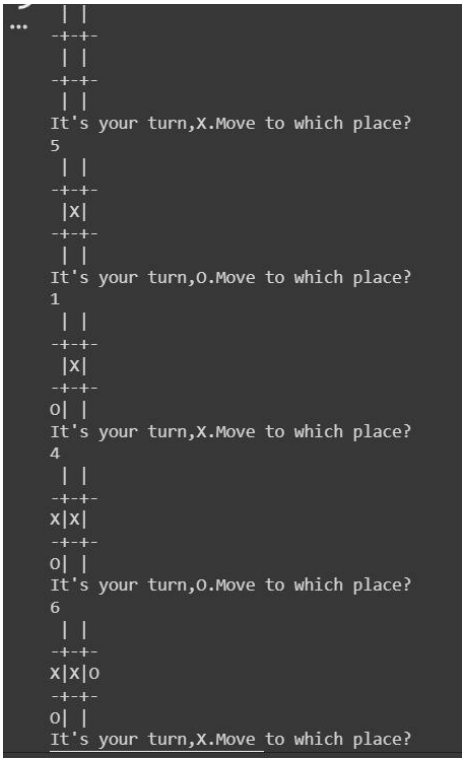
```
    print('-+-+-')
    print(board['4'] + '|' + board['5'] + '|' + board['6'])
    print('-+-+-')
    print(board['1'] + '|' + board['2'] + '|' + board['3'])

def game():

    turn = 'X'
    count = 0
    for i in range(10):
        printBoard(theBoard)
        print("It's your turn," + turn + ".Move to which place?")

        move = input()

        if theBoard[move] == ' ':
            theBoard[move] = turn
            count += 1
        else:
            print("That place is already filled.\nMove to which place?")
            continue
        if count >= 5:
            if theBoard['7'] == theBoard['8'] == theBoard['9'] != ' ':
                printBoard(theBoard)
                print("\nGame Over.\n")
```

```
        print(" **** " +turn + " won. ****")
        break
    elif theBoard['4'] == theBoard['5'] == theBoard['6'] != ' ':
        printBoard(theBoard)
        print("\nGame Over.\n")
        print(" **** " +turn + " won. ****")
        break
    elif theBoard['1'] == theBoard['2'] == theBoard['3'] != ' ':
        printBoard(theBoard)
        print("\nGame Over.\n")
        print(" **** " +turn + " won. ****")
        break
    elif theBoard['1'] == theBoard['4'] == theBoard['7'] != ' ':
        printBoard(theBoard)
        print("\nGame Over.\n")
        print(" **** " +turn + " won. ****")
        break
    elif theBoard['2'] == theBoard['5'] == theBoard['8'] != ' ':
        printBoard(theBoard)
        print("\nGame Over.\n")
        print(" **** " +turn + " won. ****")
        break
    elif theBoard['3'] == theBoard['6'] == theBoard['9'] != ' ':
        printBoard(theBoard)
        print("\nGame Over.\n")
```

```
            print(" **** " +turn + " won. ****")
            break
        elif theBoard['7'] == theBoard['5'] == theBoard['3'] != ' ':
            printBoard(theBoard)
            print("\nGame Over.\n")
            print(" **** " +turn + " won. ****")
            break
        elif theBoard['1'] == theBoard['5'] == theBoard['9'] != ' ':
            printBoard(theBoard)
            print("\nGame Over.\n")
            print(" **** " +turn + " won. ****")
            break

    if count == 9:
        print("\nGame Over.\n")
        print("It's a Tie!!")

    if turn =='X':
        turn = 'O'
    else:
        turn = 'X'

restart = input("Do want to play Again?(y/n)")
if restart == "y" or restart == "Y":
    for key in board_keys:
```

```
        theBoard[key] = " "
    game()

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

OUTPUT:



RESULT: Hence, the implementation of toy problem was successfully executed.

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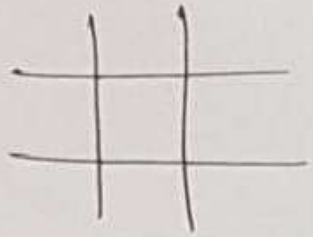
INITIAL STATE



3×3 board

FINAL STATE

X	O	X
X	O	O
O	X	X

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STEP 5 :- Finally, we are ready to begin the game.

RESULT :-

Hence, the implementation of toy problem was successfully executed.