(1BM22CS241)

Lab 1: Implement Tic–Tac–Toe Game.

```
arr = [[' ' for _ in range(3)] for _ in range(3)]

def check(arr):
    for i in range(3):
        curr = arr[i][0]
        vcurr = arr[0][i]
        if curr != ' ':
            if all(arr[i][j] == curr for j in range(3)) or all(arr[j][i] == vcurr for j in range(3)):
                return True
    return False

def diag(arr):
    curr = arr[0][0]
    if curr != ' ' and all(arr[i][i] == curr for i in range(3)):
        return True
    curr = arr[0][2]
    if curr != ' ' and all(arr[i][2 - i] == curr for i in range(3)):
        return True
    return False

k = 0
flag = True
while k < 9:
    x = int(input("x = "))
    y = int(input("y = "))
    if x>=3 or y>=3:
        print("Invalid input. Try again.")
        continue
    if arr[x][y] == ' ':
        arr[x][y] = 'X' if k % 2 == 0 else 'O'
        k += 1
        if check(arr) or diag(arr):
            print("Winner found!")
            print(arr[x][y])
            flag = False
        print(arr)
    else:
        print("Cell already taken")

if flag : print("Game tie!")
```

Output:

```
x = 0
y = 1
[[' ', 'X', ' '], [' ', ' ', ' '], [' ', ' ', ' ']]
x = 0
y = 0
[['O', 'X', ' '], [' ', ' ', ' '], [' ', ' ', ' ']]
x = 1
y = 0
[['O', 'X', ' '], ['X', ' ', ' '], [' ', ' ', ' ']]
x = 0
y = 2
[['O', 'X', 'O'], ['X', ' ', ' '], [' ', ' ', ' ']]
x = 2
y = 0
[['O', 'X', 'O'], ['X', ' ', ' '], ['X', ' ', ' ']]
x = 1
y = 1
[['O', 'X', 'O'], ['X', 'O', ' '], ['X', ' ', ' ']]
x = 2
y = 2
[['O', 'X', 'O'], ['X', 'O', ' '], ['X', ' ', 'X']]
x = 2
y = 1
[['O', 'X', 'O'], ['X', 'O', ' '], ['X', 'O', 'X']]
x = 1
y = 2
[['O', 'X', 'O'], ['X', 'O', 'X'], ['X', 'O', 'X']]
Game tie!

x = 1
y = 1
[[' ', ' ', ' '], [' ', 'X', ' '], [' ', ' ', ' ']]
x = 0
y = 0
[['O', ' ', ' '], [' ', 'X', ' '], [' ', ' ', ' ']]
x = 1
y = 1
Cell already taken
x = 1
y = 0
[['O', ' ', ' '], ['X', 'X', ' '], [' ', ' ', ' ']]
x = 0
y = 1
[['O', 'O', ' '], ['X', 'X', ' '], [' ', ' ', ' ']]
x = 1
y = 2
Winner found!
X
[['O', 'O', ' '], ['X', 'X', 'X'], [' ', ' ', ' ']]
```