Practical 10

Blockchain Technology

2CSDE93

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Aim: Implementing Tic-Tac-Toe game

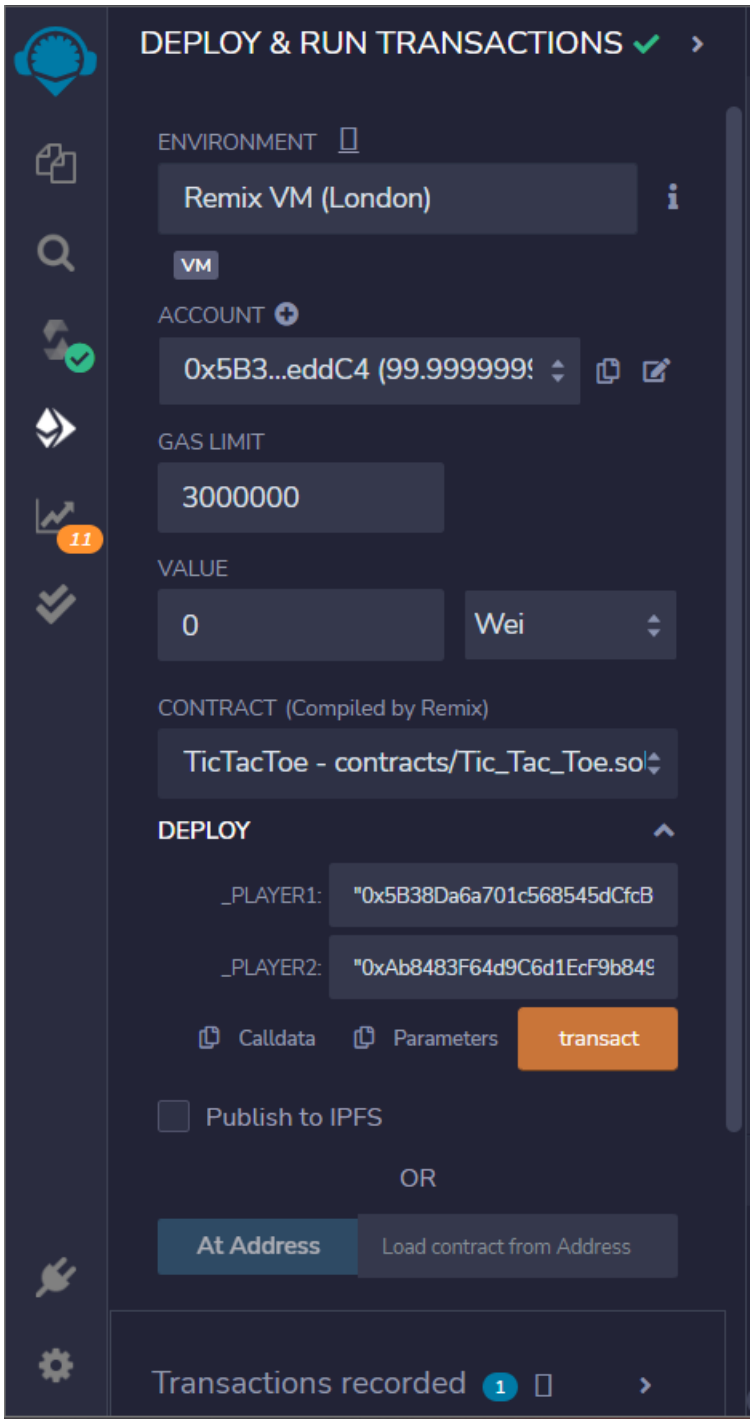
Code:

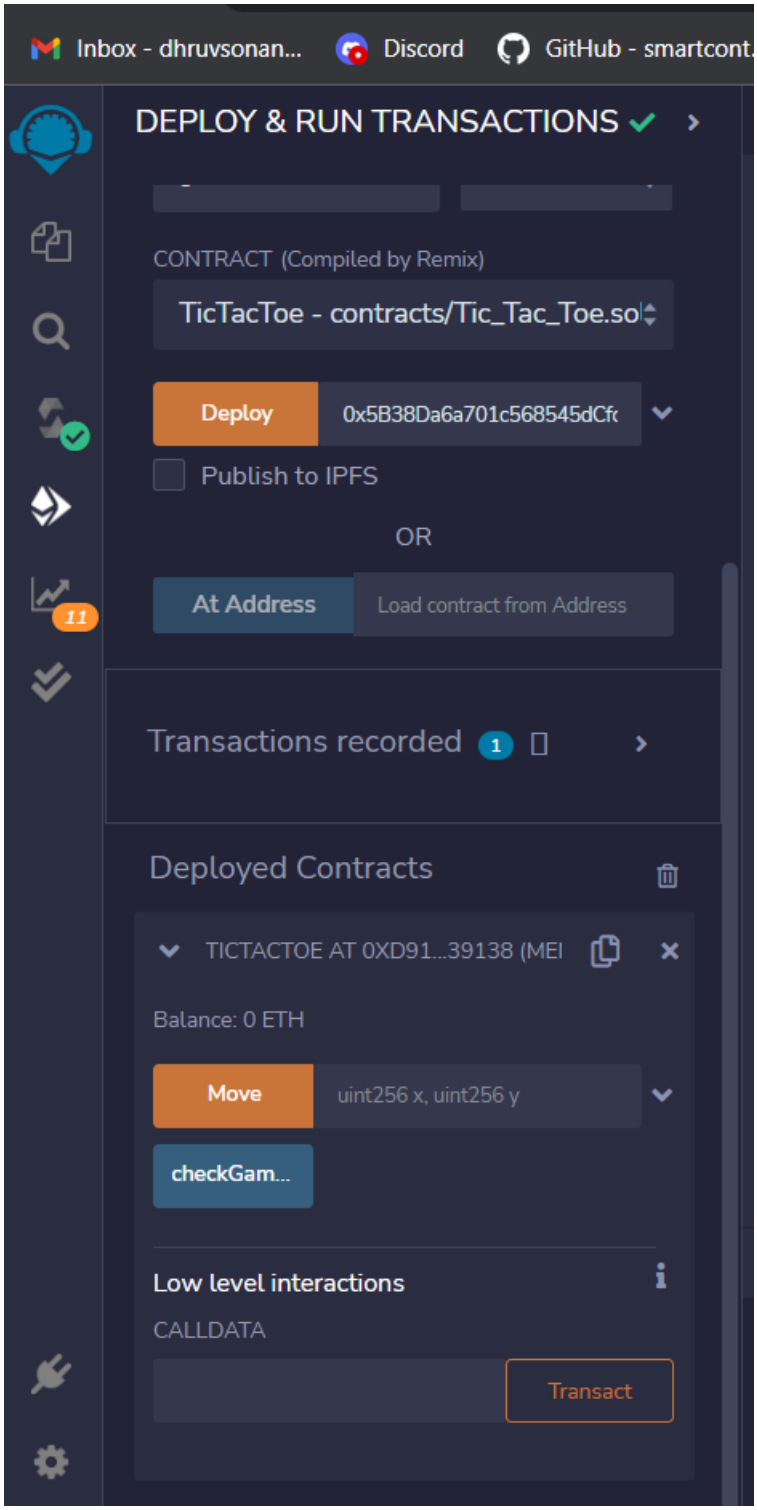
```
// SPDX-License-Identifier: MIT
pragma solidity >=0.7.0 < 0.9.0;

contract TicTacToe
{
    address player1;
    address player2;
    string[3][3] board;
    address whosTurn;
    bool gameOver;

    constructor(address _player1,address _player2){
    player1 = _player1;
    player1 = _player2;
    whosTurn = _player1;
    gameOver = false;
    }

    modifier _playerOnly() {
        require(msg.sender == whosTurn);
    _;
    }

    function Move(uint256 x,uint256 y)public _playerOnly
    {
        require(x <= 2 && x >= 0 && y >= 0 && y <= 2 &&
bytes(board[x][y]).length != 0,"Please enter a valid index");
        require(!gameOver,"Game over");

        if(whosTurn==player1)
        {
            board[x][y] = 'X'; whosTurn = player2;
        }
        else
        {
            board[x][y] = 'O'; whosTurn = player1;
        }

        string memory checkOver = checkGameOver();
```

```
        if(keccak256(bytes(checkOver)) == keccak256(bytes("O")) ||
keccak256(bytes(checkOver)) == keccak256(bytes("X")))
        {
            gameOver = true;

        }
    }

    function checkGameOver() public view returns (string memory)
    {
        for(uint256 i=0;i<board.length;i++)
        {
            for(uint256 k=1;k<board[i].length;k++)
            {
                if((keccak256(abi.encodePacked((board[i][k])))) !=
(keccak256(abi.encodePacked((board[i][ 0])))))
                {
                    break;
                }
                else if(k == board[i].length -1)
                {
                    return board[i][0];
                }
            }
        }

        for(uint256 i=1;i<board.length;i++)
        {
            if((keccak256(abi.encodePacked((board[i][i])))) !=
(keccak256(abi.encodePacked((board[0][ 0])))))
            {
                break;
            }

            if(i == board.length - 1)
            {
                 return board[0][0];
            }
        }

        uint256 tmp = board.length -1;

        for(uint256 i=0;i<board.length;i++)
        {
            if((keccak256(abi.encodePacked((board[i][tmp])))) !=
(keccak256(abi.encodePacked((board[0] [board.length - 1])))))
            {
                break;
```

```
            }

            tmp = tmp -1;

            if(i == board.length -1)
            {
                return board[0][board.length - 1];
            }
        }

        return "Not Over";
    }
}
```

Output:


DEPLOY & RUN TRANSACTIONS
ENVIRONMENT
Remix VM (London)
VM
ACCOUNT
0x5B3...eddC4 (99.999999
GAS LIMIT
3000000
VALUE
0
Wei
CONTRACT (Compiled by Remix)
TicTacToe - contracts/Tic_Tac_Toe.sol
DEPLOY
_PLAYER1:
"0x5B38Da6a701c568545dCfcB
_PLAYER2:
"0xAb8483F64d9C6d1EcF9b849
Calldata
Parameters
transact
Publish to IPFS
OR
At Address
Load contract from Address
Transactions recorded
1


Inbox - dhruvsonan...
Discord
GitHub - smartcont
DEPLOY & RUN TRANSACTIONS
CONTRACT (Compiled by Remix)
TicTacToe - contracts/Tic_Tac_Toe.sol
Deploy
0x5B38Da6a701c568545dCf
Publish to IPFS
OR
At Address
Load contract from Address
Transactions recorded 1
Deployed Contracts
TICTACTOE AT 0XD91...39138 (MEI
Balance: 0 ETH
Move
uint256 x, uint256 y
checkGam...
Low level interactions
CALLDATA
Transact