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Tic-Tac-Toe features

- Tic-Tac-Toe server สำหรับ 2 client sides as players
- Clients สามารถเลือกได้ว่าจะเป็น pone(X) หรือ ptwo(O)
- แสดงบอร์ดในการเล่น

การเข้าสู่ Server

server.js

```
const net = require('net');
const port = 5000;
const host = 'localhost';
const server = net.createServer();
    server.listen(port, host, () => {
                console.log('HOST : ' + host + '\n' + 'PORT : ' + port);
            });
```

client.js

```
var net = require('net');
var HOST = 'localhost';
var PORT = 5000;
var client = new net.Socket();
```

แสดงผล

```
HOST : localhost
PORT : 5000
 Clinet: 127.0.0.1 : 60431 Connected!
 Clinet: 127.0.0.1 : 60434 Connected!
```

Client จะ join server และสร้าง socket ในตัวอย่างคือ localhost:60431 และ localhost:60434

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การเลือกฝั่งผู้เล่น

server.js

```
socket.on('data', (data) => {
    console.log('Client: ' + clientAddress + '\n' + 'Input : ' + data);

    switch (state) {
      case 0:
        if (data.toString() == 'pone') {
          socket.write('Player 1! Connected\n' + 'Wait for another player!')
          state = 1;
          console.log('state=' + state)
        }
        else {
          socket.write('INVALID : Enter "pone"')
        }
        break;

      case 1:
        if (data.toString() == 'ptwo') {
          socket.write('Player 2! Connected\n')
          sockets.forEach((sock) => {
             sock.write('Game Start!' + '\n');
          });
          state = 2;
          console.log('state=' + state)

        }
        else socket.write('INVALID: Enter "ptwo"')
        break;
```

Client side input pone

```
Game Status: Player 1! Connected
Wait for another player!
```

Another client side input ptwo

```
Game Status: Player 2! Connected
Game Status: Game Start!
```

Server side

```
Client: 127.0.0.1 : 60431
Input : pone
state=1
Client: 127.0.0.1 : 60434
Input : ptwo
state=2
```

Client side input ptwo without pone in the room

```
Game Status: INVALID : Enter "pone"
```

Adjust pone as X and ptwo as O

```
  if (count < 9) {
            if(count%2 == 0 || count == 0) {
              arr[i][j] = "X";
              count++;
            }
            else if(count%2 == 1){
              arr[i][j] = "O";
              count++;
            }
```

เนื่องจากเป็นการผลัดการเล่นเป็น turn-based จึงสามารถกำหนดให้ผู้เล่นที่เล่น turn แรก (0,2,4,6,8) เป็น X และผู้เล่นอีกคนเป็น O (1,3,5,7)

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Game Board

Create game board on server.js

Create array 3x3

```
const arr = [
                [" "," "," "],
                [" "," "," "],
                [" "," "," "]
            ]
```

Design game board

```
          let i = parseInt(String(data).charAt(0));
          let j = parseInt(String(data).charAt(1));

          console.log( '\n' +
                       '     |     |      ' + '\n' +
                       '  '+ arr[0][0]+'  |  '+ arr[0][1]+'  |  '+ arr[0][2]+'  ' + '\n' +
                       '_____|_____|_____ ' + '\n' +
                       '     |     |      ' + '\n' +
                       '  '+ arr[1][0]+'  |  '+ arr[1][1]+'  |  '+ arr[1][2]+'  ' + '\n' +
                       '_____|_____|_____ ' + '\n' +
                       '     |     |      ' + '\n' +
                       '  '+ arr[2][0]+'  |  '+ arr[2][1]+'  |  '+ arr[2][2]+'  ' + '\n' +
                       '     |     |      ')
          sockets.forEach((sock) => {
            sock.write('\n' +
                     '     |     |      ' + '\n' +
                     '  '+ arr[0][0]+'  |  '+ arr[0][1]+'  |  '+ arr[0][2]+'  ' + '\n' +
                     '_____|_____|_____ ' + '\n' +
                     '     |     |      ' + '\n' +
                     '  '+ arr[1][0]+'  |  '+ arr[1][1]+'  |  '+ arr[1][2]+'  ' + '\n' +
                     '_____|_____|_____ ' + '\n' +
                     '     |     |      ' + '\n' +
                     '  '+ arr[2][0]+'  |  '+ arr[2][1]+'  |  '+ arr[2][2]+'  ' + '\n' +
                     '     |     |      ' + '\n' +
                     'Player ' + ((count%2)+1) + ' Turn');
          });
```

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Game Rule

Input Method

```
let i = parseInt(String(data).charAt(0));
let j = parseInt(String(data).charAt(1));
```

example

```
21

Game Status:
     |     |
     |     |
_____|_____|_____
     |     |
     |     |
_____|_____|_____
     |     |
     |  X  |
     |     |
Player 2 Turn
```

Win condition

```
if ((arr[0][0] != " " &&arr[0][0] == arr[0][1] && arr[0][0] == arr[0][2]) ||
             (arr[0][0] != " " &&arr[0][0] == arr[1][0] && arr[0][0] == arr[2][0]) ||
             (arr[0][0] != " " &&arr[0][0] == arr[1][1] && arr[0][0] == arr[2][2])) {
            sockets.forEach((sock) => {
               sock.write(arr[0][0] + ' Win!!!')
            });
            state = 3
          }
          else if ((arr[1][1] != " " && arr[1][1] == arr[0][1] && arr[1][1] == arr[2][1]) ||
                   (arr[1][1] != " " && arr[1][1] == arr[1][0] && arr[1][1] == arr[1][2])) {
            sockets.forEach((sock) => {
                sock.write(arr[1][1] + ' Win!!!');
            });
            state = 3
          }
          else if ((arr[2][2] != " " && arr[2][2] == arr[0][2] && arr[2][2] == arr[1][2]) ||
                   (arr[2][2] != " " && arr[2][2] == arr[2][0] && arr[2][2] == arr[2][1])) {
            sockets.forEach((sock) => {
                sock.write(arr[2][2] + ' Win!!!');
            });
            state = 3
          }
          else if ((arr[2][0] != " " && arr[2][0] == arr[1][1] && arr[2][0] == arr[0][2])) {
            sockets.forEach((sock) => {
                sock.write(arr[2][0] + ' Win!!!');
            });
            state = 3
```

example

```
Game Status:
     |     |
  O  |     |
_____|_____|_____
     |     |
     |  O  |
_____|_____|_____
     |     |
  X  |  X  |  X
     |     |

Game Status: X Win!!!
```

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Draw ก็ต่อเมื่อใน turn ที่ 9 ยังไม่มีผู้ชนะ

```
else if (count == 9) {
            sockets.forEach((sock) => {
                sock.write('Draw!!!');
            });
            state = 3
```

example

```
Game Status:
     |     |
  X  |  O  |  X
_____|_____|_____
     |     |
  O  |  O  |  X
_____|_____|_____
     |     |
  X  |  X  |  O
     |     |

Game Status: Draw!!!
```

FlowChart

```
st=>start: IDLE
op=>operation: Waiting for player
cond=>condition: ptwo and pone ?
op2=>operation: Player input coordinate
cond2=>condition: Any player win or draw?
e=>end: End

st->op->cond
cond(yes)->op2
cond(no)->op
op2->cond2
cond2(yes)->e
cond2(no)->op2
```

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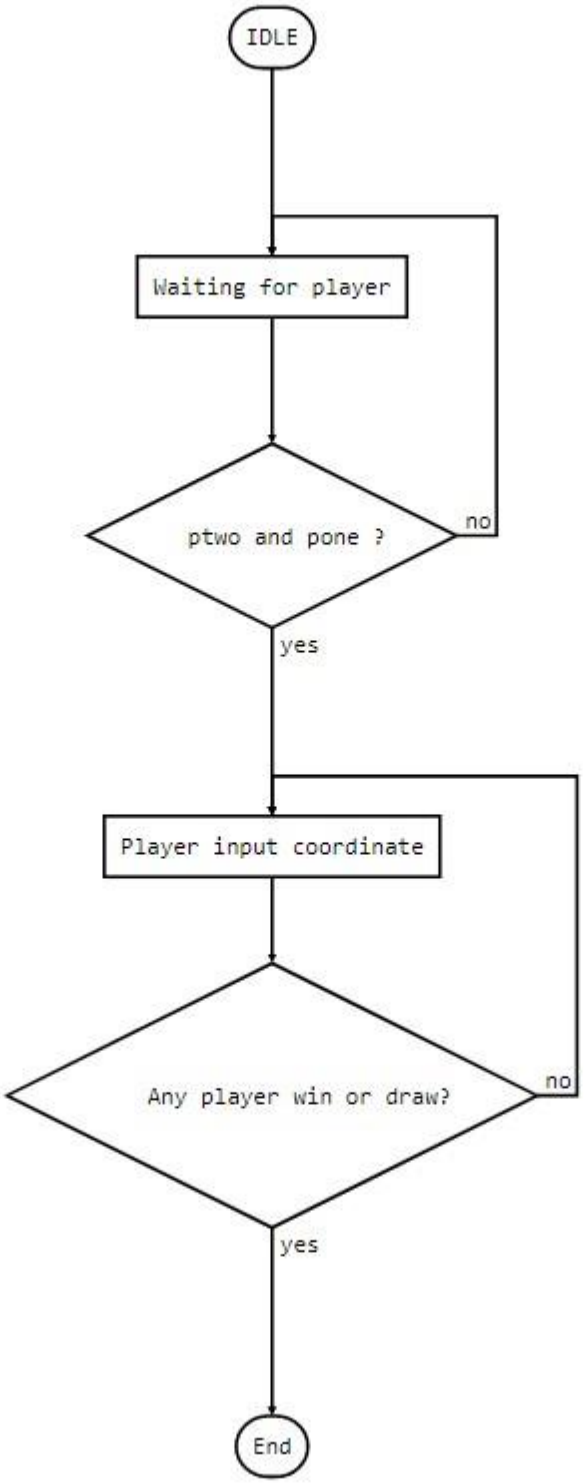
Flowchart



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Sequence Diagram