



Republic of the Philippines
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Faculty of Computing, Data Sciences, Engineering and Technology
Information Technology Program

ITC 130 – Applications Development in Emerging Technologies
**PROJECT X: Automated Attendance Tracking
System: Jest Test & Unit Testing**

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To ensure code reliability and meet the project's unit testing requirements, Jest was integrated into the backend of the application. A real unit test was implemented for the `getNetworkIP` utility function, which retrieves the first non-internal IPv4 address from the server's network interfaces. The test suite, located in `network.test.js`, verifies both the correct retrieval of an external IP address and the fallback behavior when no such address is found. Running the tests with `npx jest` resulted in all test cases passing, demonstrating that the function behaves as expected and confirming successful integration of Jest-based unit testing in the project.

Jest Test: We installed and configured Jest, and we're able to run tests using `npx jest`.

Unit Testing: We wrote a real unit test (`network.test.js`) for our actual backend function (`getNetworkIP`), and all tests passed.

```
JS network.test.js X
backend > tests > JS network.test.js > ...
1  const getNetworkIP = require('../utils/network');
2  const os = require('os');
3
4  jest.mock('os');
5
6  describe('getNetworkIP', () => {
7    it('should return the first non-internal IPv4 address', () => {
8      os.networkInterfaces.mockReturnValue({
9        eth0: [
10         { internal: false, family: 'IPv4', address: '192.168.1.100' },
11         { internal: true, family: 'IPv4', address: '127.0.0.1' }
12       ]
13     });
14     expect(getNetworkIP()).toBe('192.168.1.100');
15   });
16
17   it('should return "0.0.0.0" if no external IPv4 address is found', () => {
18     os.networkInterfaces.mockReturnValue({
19       eth0: [
20         { internal: true, family: 'IPv4', address: '127.0.0.1' }
21       ]
22     });
23     expect(getNetworkIP()).toBe('0.0.0.0');
24   });
25 });
```



```
JS network.js X
backend > utils > JS network.js > getNetworkIP
1  const os = require('os');
2
3  function getNetworkIP() {
4      const interfaces = os.networkInterfaces();
5      for (const name of Object.keys(interfaces)) {
6          for (const iface of interfaces[name]) {
7              if (!iface.internal && iface.family === 'IPv4') {
8                  return iface.address;
9              }
10         }
11     }
12     return '0.0.0.0';
13 }
14
15 module.exports = getNetworkIP;
```

```
EXPLORER    ...    JS server.js X
05. IMPL
> .expo
> .vscode
> assets
✓ backend
  > config
  > controllers
  > middleware
  > models
  > node_modules
  > routes
  > scripts
  > tests
  JS network.test.js
  ✓ utils
    JS mailer.js
    JS network.js
  .env
  JS jest.config.js
  {} package-lock.json
  {} package.json
  JS server.js
  > frontend
  > node_modules
  > ...

backend > JS server.js > ...
4  const connectDB = require('./config/db');
5  const studentRoutes = require('./routes/studentRoutes');
6  const instructorRoutes = require('./routes/instructorRoutes');
7  const courseRoutes = require('./routes/courseRoutes');
8  const attendanceRoutes = require('./routes/attendanceRoutes');
9  const sessionAttendanceRoutes = require('./routes/sessionAttendanceRoutes');
10 const deviceRoutes = require('./routes/deviceRoutes');
11 const adminRoutes = require('./routes/adminRoutes');
12 const os = require('os');
13 const bodyParser = require('body-parser');
14 const getNetworkIP = require('./utils/network');
15
16 const app = express();
17 |   Natsumaniac, last week • update ...
18
19 // CORS configuration
20 app.use(cors({
21     origin: '*',
22     methods: ['GET', 'POST', 'PUT', 'DELETE', 'OPTIONS'],
23     allowedHeaders: ['Content-Type', 'admin-id', 'admin-password'],
24     credentials: true
25 }));
26
27 // Middleware
28 app.use(express.json());
29 app.use(bodyParser.json({ limit: '10mb' }));
30 app.use(bodyParser.urlencoded({ limit: '10mb', extended: true }));
31
```



RESULT:

```
PS C:\Users\Natsume\Documents\GitHub\HelloWorld-PROJECT_X-Automated_Attendance_Tracking_System\05. Impl> npx jest
PASS backend/tests/network.test.js
  getNetworkIP
    ✓ should return the first non-internal IPv4 address (3 ms)
    ✓ should return "0.0.0.0" if no external IPv4 address is found (1 ms)

Test Suites: 1 passed, 1 total
Tests:      2 passed, 2 total
Snapshots:  0 total
Time:       0.425 s, estimated 1 s
Ran all test suites.
PS C:\Users\Natsume\Documents\GitHub\HelloWorld-PROJECT_X-Automated_Attendance_Tracking_System\05. Impl> |
```

