

**Lab Exercise 4****Software Engineering - Year - 3****2021**

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**Lab Session: NodeJS****Objective:** Teach main features of NodeJS runtime + JavaScript library

1. Hello world.
  - a. Check the node version of the machine by issuing the following command.  
`node -version`
  - b. Create a file named app.js.
  - c. Use default console log command to print string to the console.  
`console.log('Hello World');`
  - d. Type the following command in the command prompt (Command should be opened in the working directory).  
`node app.js`
2. Use OS system library.
  - a. Import the OS system module to your file.  
`const os = require('os');`
  - b. Obtain System architecture, platform and number of CPUs from the OS module and print them to the console.  
`console.log('Architecture ' + os.arch());`  
`console.log('CPUs ' + os.cpus().length);`  
`console.log('OS ' + os.platform());`
  - c. Run application and check the output.
3. Read a file.
  - a. Create a file named test.txt and add the following content.  
NodeJS is awesome.
  - b. Import the fs system module to read the file.  
`const fs = require('fs');`

- c. Use the system variable `__dirname` to set the file location.

```
const fileName = __dirname + '/test.txt';
```

- d. Read the file using `readFile` asynchronous method and print the content of the file to console.

```
fs.readFile(fileName, (err, data) => {  
  if (err) {  
    console.error(err);  
  }  
  
  console.log(data.toString());  
});
```

- e. Try printing the value of `data` without `toString` method.

- f. Use the `readFileSync` method to read the file synchronously.

```
const data = fs.readFileSync(fileName);  
console.log(data.toString());
```

4. Use streams to copy content of a file.

- a. Add two variables containing path to the source and destination files.

```
const fileName = __dirname + '/test.txt';  
const outFileName = __dirname + '/test-copy.txt';
```

- b. Create read stream and write stream from the source file and destination file respectively.

```
const readStream = fs.createReadStream(fileName);  
const writeStream = fs.createWriteStream(outFileName);
```

- c. Pipe the read stream to write stream.

```
readStream.pipe(writeStream);
```

- d. Verify the file named `test-copy.txt` is being created with the same content as the `test.txt`.

- e. Optionally listen to the `data` event of the read stream and print the output.

```
readStream.on('data', data => {  
  console.log(data.toString());  
});
```

## 5. Http Server

- a. Import the http module from the core libraries.

```
const http = require('http');
```

- b. Create a httpServer that listens to port 3000 and return HTML with Hello World text in h1 header upon GET request.

```
http.createServer((req, res) => {  
  res.setHeader('Content-Type', 'text/html');  
  res.write('<h1>Hello World</h1>');  
  res.end();  
}).listen(3000);
```

- c. Check the output of the code by running the code and accessing <http://localhost:3000> in browser.

- d. Optionally add a POST request that accepts form field name and return HTML with Hello {name}.

```
const http = require('http');  
  
http.createServer((req, res) => {  
  
  res.setHeader('Content-Type', 'text/html');  
  
  switch (req.method) {  
    case 'GET':  
      res.write('<h1>Hello World</h1>');  
      res.end();  
      break;  
    case 'POST':  
      req.on('data', data => {  
        res.write('<h1>Hello ' + data + '</h1>');  
        res.end();  
      });  
      break;  
  }  
  
}).listen(3000, (err) => {  
  console.log('Server is listening to port 3000')  
});
```