**Module 3: Self LearnIT**

Sanjana Balaji

Ira A. Fulton School of Engineering, Arizona State University

IFT 598: Middleware Programming and Database Security

Prof. Dinesh Sthapit

15 February 2022

**Step 1:**

**Basic concepts of NodeJS – Libuv, Event Loop, Libev**

NodeJS operates on an asynchronous level. The Libuv library aides NodesJs to create a thread to facilitate the I.O operations. While NodeJS assigns several threads for the operations, the programmer is given access to only a single thread for simplicity. Once an HTTP request is made using the Node to the server, the libuv thread is created and new requests can be accepted. When all the other events are triggered by the libuv, the response of the code is returned to the programmer.

Installing npm:

Text

Description automatically generated

**Step 2:**

**Building a Web Page in Node.js**

**Created a website on the localhost:5500 and displayed “Hello! This is Sanjana!”**

Text

Description automatically generated

A screenshot of a computer

Description automatically generated with medium confidence

Graphical user interface, text, application, website

Description automatically generated

**Now testing the code with postman:**

Graphical user interface, text, application, email

Description automatically generated

**Step 3: Node Modules and NPM**

Node modules are built-in function or user-created functions that can be reused in the applications.

Functions like fs, http and net are some examples of the built-in functions. Node modules can be installed using npm (Node Package Manager).

Built-in Node Modules: Installing Express:

A screenshot of a computer

Description automatically generated with medium confidence

Creating a custom module & install

Text

Description automatically generated

Text

Description automatically generated

Text

Description automatically generated

Text

Description automatically generated

Testing the created module:

Text

Description automatically generated

The calculator module successfully gives the output of the above code as 30.

**Step 4: File System Module**

The file system module enables to access the files that are present in the operating system. These files can be read and written on. Three methods are provided by the module to create files:

* fs.open()
* fs.writeFile()
* fs.appendFile()

Text

Description automatically generated

**fs.open():**

This method opens the existing file & in case, the file doesn’t exist in the given path, it creates a new file. It also takes another parameter which acts as a flag to specify whether the open file will be read or written into.

Text

Description automatically generated

* **fs.writeFile():**

This method writes/rewrites the file with the given content, replacing the existing content, f present.

* Text

  Description automatically generated

Graphical user interface, text, application, email

Description automatically generated

* **fs.appendFile():**

This method appends the given content at the end of the document.

Text

Description automatically generated

Graphical user interface, text, application, email

Description automatically generated

There are similar methods to delete, copy and rename files.

**Step 5: Express Framework**

Express is a popular framework that is used to aide in the web application development process.

Route is the end point for the web application. Example: www.example.com/route

Text

Description automatically generated

Text

Description automatically generated

Text

Description automatically generated

Home Route:

Graphical user interface, text, application, email

Description automatically generated

Profile Route:

Graphical user interface, text, application, email

Description automatically generated

Login Route:

Graphical user interface, text, application, email

Description automatically generated

Logout Route:

Graphical user interface, text, application, email

Description automatically generated  
Middleware:

Middleware is essentially a asset of functions that are executed in a specific order.

Express offers several types of middleware. In the previous example, router middleware was used.

**Step 6: Databases**

Database forms the crux of any web application. The databases discussed in the tutorial material is:

* MySQL
* MongoDB
* PostgreSQL
* Redis

MySQL:

Text

Description automatically generated

A screenshot of a computer

Description automatically generated with medium confidence

Creating a Database in MySQL:

For this code to run, MySQL was downloaded (which further required Visual Studio).

Then in the command prompt mysql was installed using the syntax, npm install mysql.

var mysql = require('mysql');

var con = mysql.createConnection({

    host: "localhost",

    user: "root",

    password: "password",

});

con.connect(function(err) {

    if (err) throw err;

    console.log("Connected!");

    con.query("CREATE DATABASE MYSQLDatabase", function (err, result) {

if (err) throw err;

    console.log("Database created");

    });

});

Text

Description automatically generated

Similarly, MongoDB, PostgreSQL and Redis can also be used to handle databases.

**Step 7: Deploying Node application to a Cloud Server.**

**I would be using GitHub to deploy the node application**