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## Library vs framework

- Library----->a library is a collection of pre written code that can be used to perform specific task. Examples----->axios
- Framework----->a framework is set of pre-written code that provides a structure for developing software applications. Examples ----->express

## Express

- A nodejs web application framework that helps us to make web applications
- It is used for server side programming
- Express is actually present in a package inside npm
- <http://expressjs.com/en/4x/api.html> -----> documentation for express

## Function of express

- Listen to incoming request
- Parse the request message
- Match response with routes
- Sending response to suitable routes

## Getting started with express

- Create a folder named expressdir
- Open terminal and do these things
  - Npm init
  - Npm install express
  - Touch index.js
- Inside index.js write below algo and run it

```
EXPRESSDIR
├── node_modules
├── package-lock.json
├── package.json
└── index.js
```

```
1 const express=require("express");
2
3 const app=express();
4 console.dir(app);
5 console.log("kartik");
```

```
Kartik Marik@DESKTOP-TQ9RET MINGW64 ~
$ cd Desktop
Kartik Marik@DESKTOP-TQ9RET MINGW64 ~/Desktop
$ cd expressdir
Kartik Marik@DESKTOP-TQ9RET MINGW64 ~/Desktop/expressdir
$ npm init
This utility will walk you through creating a package.json file.
It only covers the most common items, and tries to guess sensible defaults.

See 'npm help init' for definitive documentation on these fields
and exactly what they do.

Use 'npm install <pkg>' afterwards to install a package and
save it as a dependency in the package.json file.

Press ^C at any time to quit.
package name: (expressdir)
version: (1.0.0)
description:
entry point: (index.js)
test command:
git repository:
keywords:
author: kartik marik
license: (ISC)
About to write to C:\Users\Kartik Marik\Desktop\expressdir\package.json:
{
  "name": "expressdir",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "author": "kartik marik",
  "license": "ISC"
}

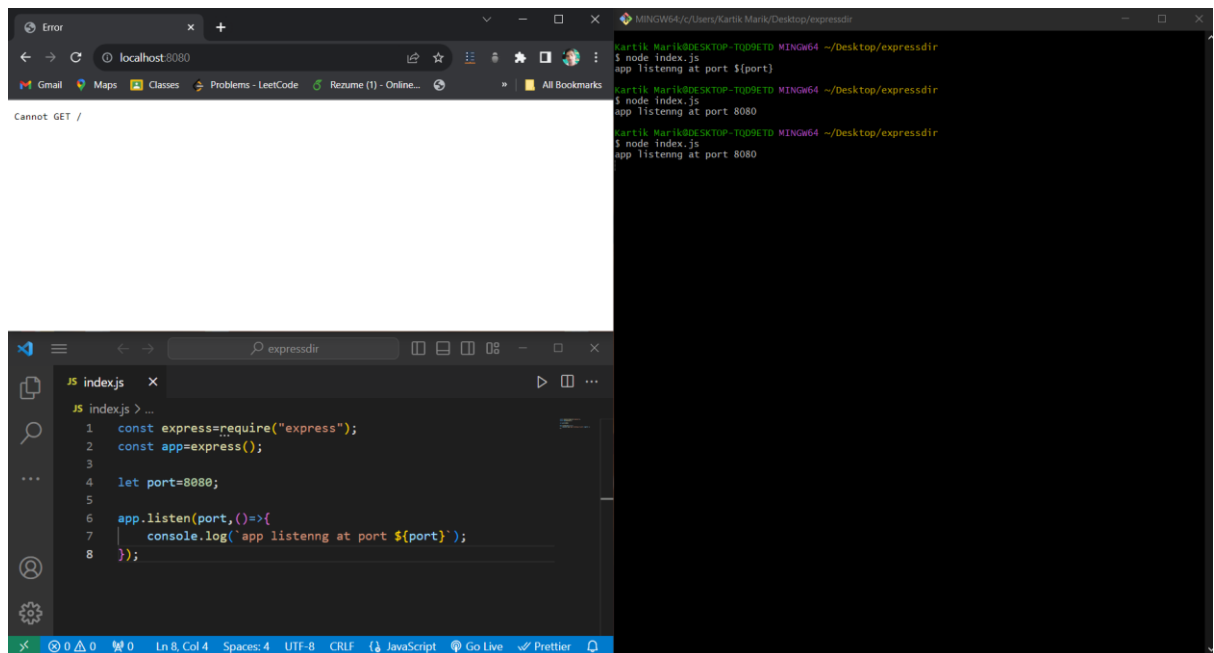
Is this OK? (yes)
Kartik Marik@DESKTOP-TQ9RET MINGW64 ~/Desktop/expressdir
$ touch index.js
Kartik Marik@DESKTOP-TQ9RET MINGW64 ~/Desktop/expressdir
$ npm install express
added 58 packages, and audited 59 packages in 4s

8 packages are looking for funding
run 'npm fund' for details

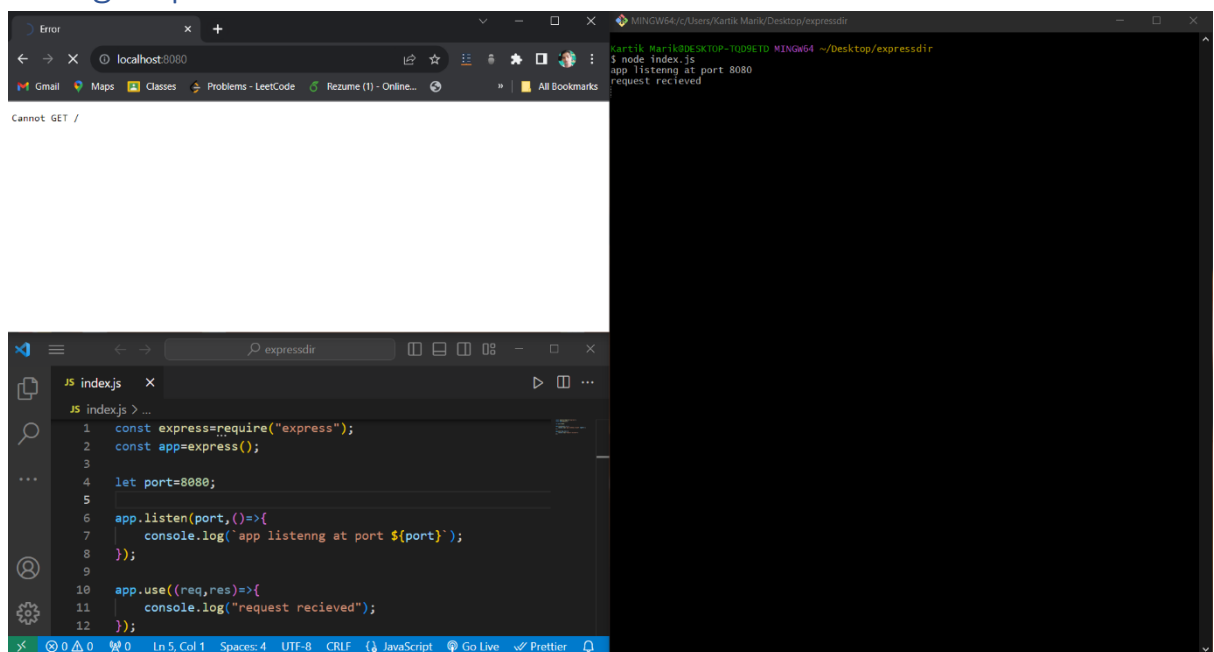
found 0 vulnerabilities
```

## Port

- Port are logical endpoints of a network connection that is used to exchange information between a webserver and a web client.



## Handling request

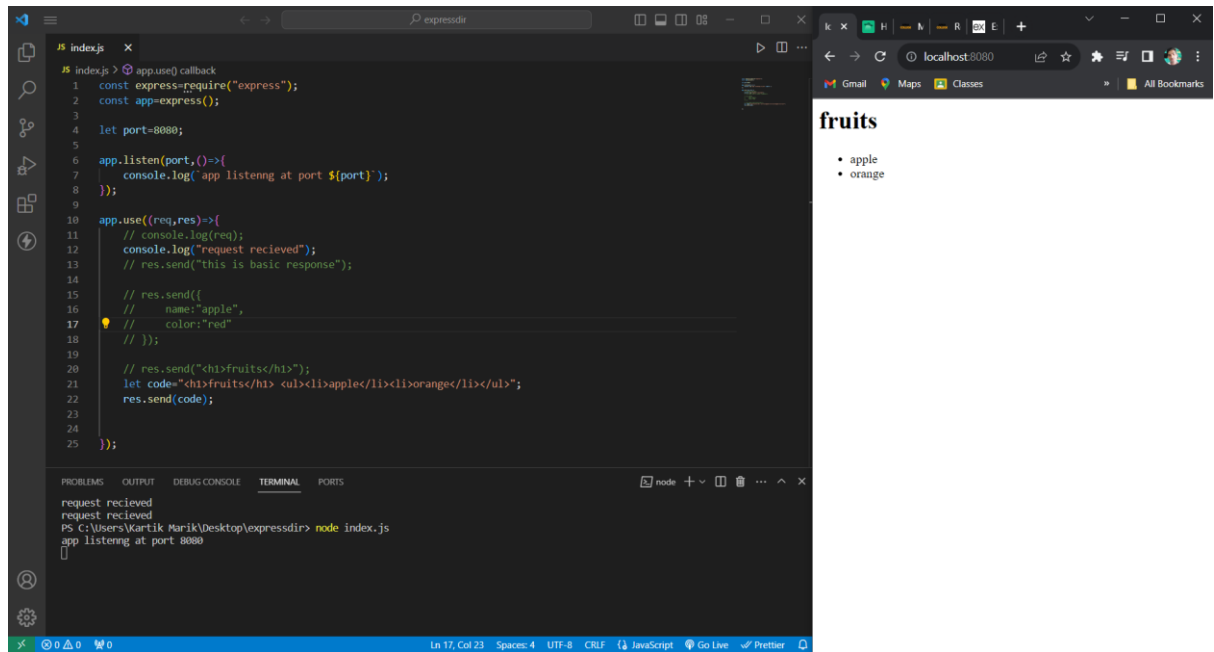


## Sending request through hopscotch

- <https://hoppscotch.io/>
- Add the extension to send request from hopscotch in local
- <https://github.com/hoppscotch/hoppscotch/discussions/2051>
- Do changes and then send request and see terminal

## Sending response

- Sending string
- Sending objects
- Sending html file



The screenshot shows a VS Code editor with a file named `index.js` containing the following code:

```
1 const express=require("express");
2 const app=express();
3
4 let port=8080;
5
6 app.listen(port,()=>{
7   console.log("app listening at port ${port}");
8 });
9
10 app.use((req,res)=>{
11   // console.log(req);
12   console.log("request recieved");
13   // res.send("this is basic response");
14
15   // res.send({
16   //   name:"apple",
17   //   color:"red"
18   // });
19
20   // res.send("<h1>fruits</h1>");
21   let code="<h1>fruits</h1> <ul><li>apple</li><li>orange</li></ul>";
22   res.send(code);
23
24
25 });
```

The terminal output shows:

```
request recieved
request recieved
PS C:\Users\Kartik Marik\Desktop\expressdir> node index.js
app listening at port 8080
```

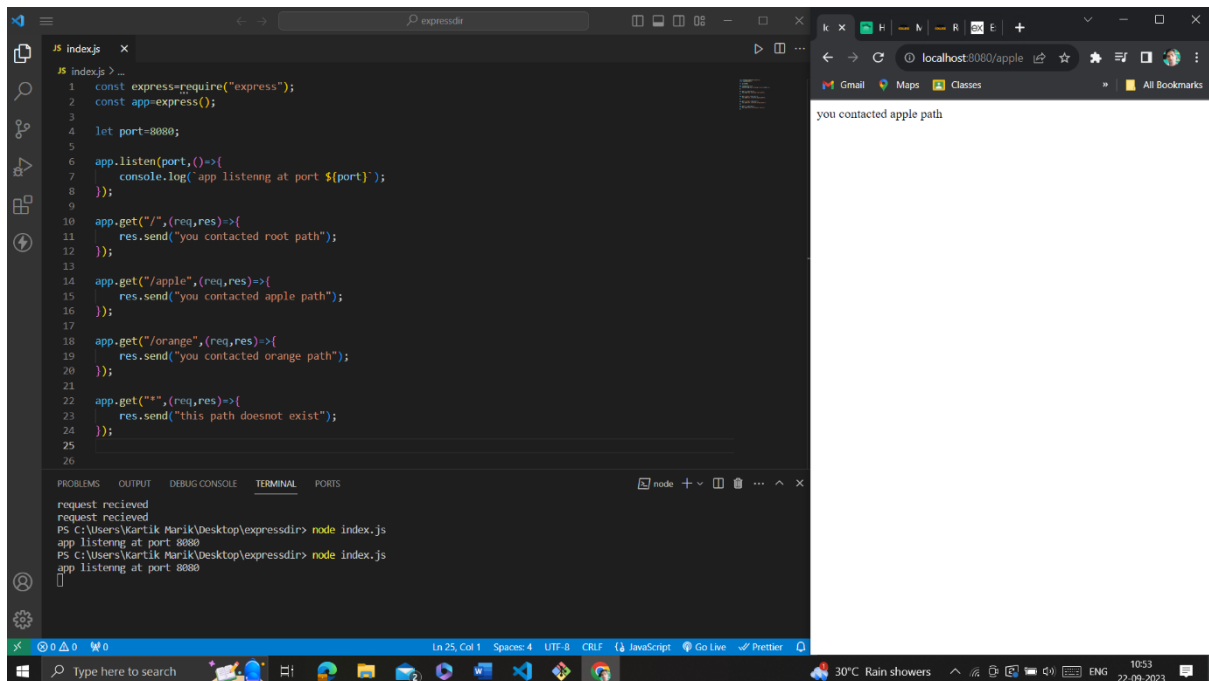
The web browser at `localhost:8080` displays the following HTML:

fruits

- apple
- orange

## Routing

- It is a process of selecting a path for traffic in a network or between or across multiple networks
- Get method is used for routing



The screenshot shows a VS Code editor with a file named `index.js` containing the following code:

```
1 const express=require("express");
2 const app=express();
3
4 let port=8080;
5
6 app.listen(port,()=>{
7   console.log("app listening at port ${port}");
8 });
9
10 app.get("/",(req,res)=>{
11   res.send("you contacted root path");
12 });
13
14 app.get("/apple",(req,res)=>{
15   res.send("you contacted apple path");
16 });
17
18 app.get("/orange",(req,res)=>{
19   res.send("you contacted orange path");
20 });
21
22 app.get("",(req,res)=>{
23   res.send("this path doesnot exist");
24 });
25
26
```

The terminal output shows:

```
request recieved
request recieved
PS C:\Users\Kartik Marik\Desktop\expressdir> node index.js
app listening at port 8080
PS C:\Users\Kartik Marik\Desktop\expressdir> node index.js
app listening at port 8080
```

The web browser at `localhost:8080/apple` displays the following text:

you contacted apple path

## Nodemon

- To automatically restart server with code changes
- Always install globally and in gitbash or cmd not on vs terminal

### Path parameter

The top screenshot shows a VS Code editor with a file named `index.js`. The code is as follows:

```
1 const express=require("express");
2 const app=express();
3
4 let port=8080;
5
6 app.listen(port,()=>{
7   console.log("app listening at port ${port}");
8 });
9
10 app.get("/:username/:id",(req,res)=>{
11   console.log(req.params);
12   res.send("hello, i am root");
13 })
14
15
16
```

The terminal on the right shows Nodemon logs: "Node.js v18.17.1", "app crashed - waiting for file changes before starting...", "nodemon starting node index.js", "app listening at port 8080", and "(username: 'kartik', id: '101')". The browser window at `localhost:8080/kartik/101` displays "hello, i am root".

The bottom screenshot shows the same code, but with a syntax error in line 12: `res.send('welcome to page of @${username}');`. The terminal shows a `SyntaxError: Unexpected token '}'` and "Node.js v18.17.1" crashing. The browser window displays "welcome to page of @kartik".

### Query string

- Observe the url very carefully

