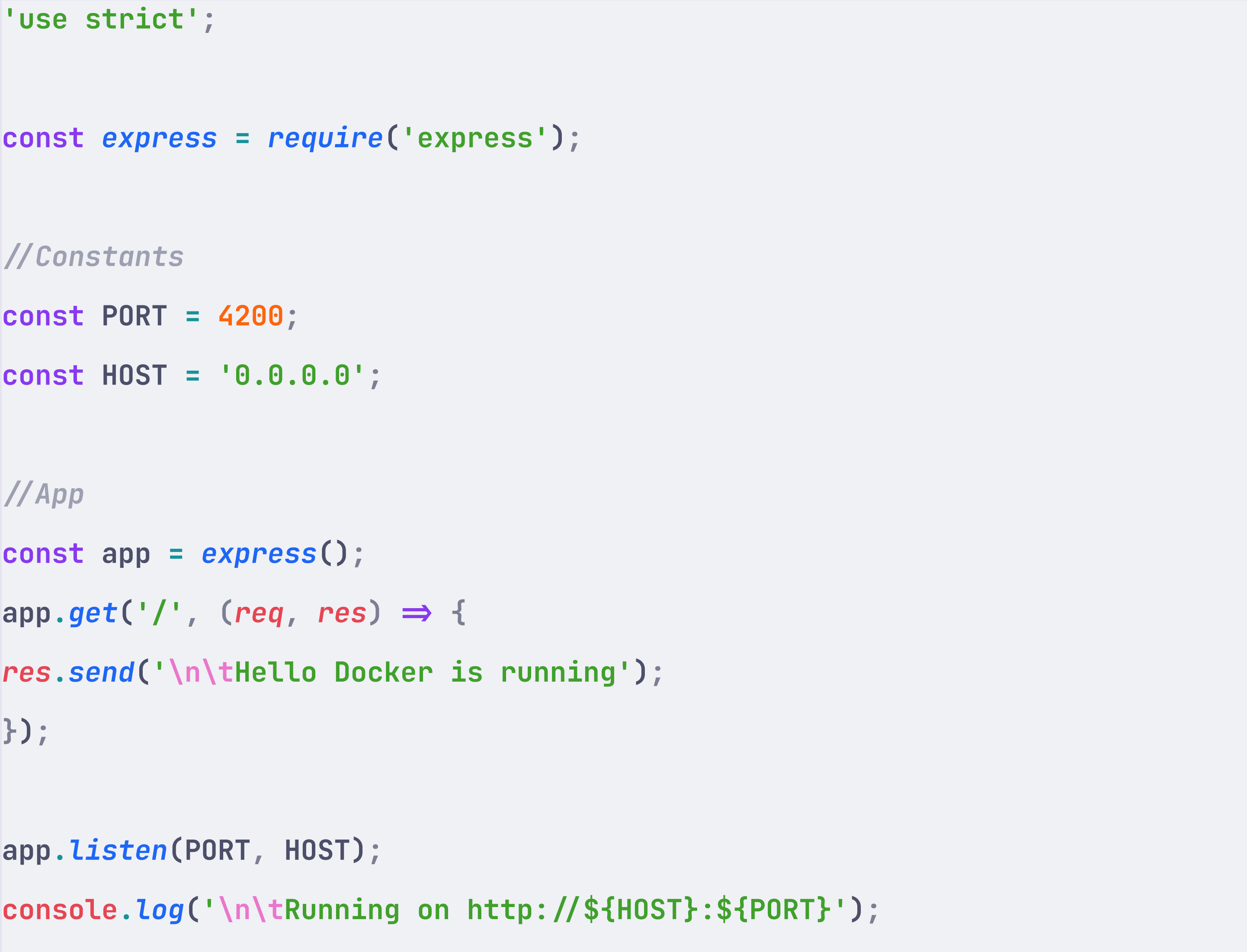
Name - Yash Lakhtariya
Enrollment number - 21162101012
Branch - CBA   Batch - 51
Microservices Practical 13

Aim : **To understand deploying a Node.js application into a Docker container.**

Scenario : As a part of your Docker based project, your trainer knows you have basic understanding of Docker as well as Node, and hence instructs you to create a Node.js Application and deploy it in a Docker Container. This application has to be suitable for development, and not for a production deployment.

Tasks, codes and screenshots :

1. **Create a simple web application in Node.js.**



```
'use strict';


const express = require('express');


//Constants
const PORT = 4200;
const HOST = '0.0.0.0';


//App
const app = express();
app.get('/', (req, res) => {
res.send('\n\tHello Docker is running');
});


app.listen(PORT, HOST);
console.log('\n\tRunning on http://${HOST}:${PORT}');
```

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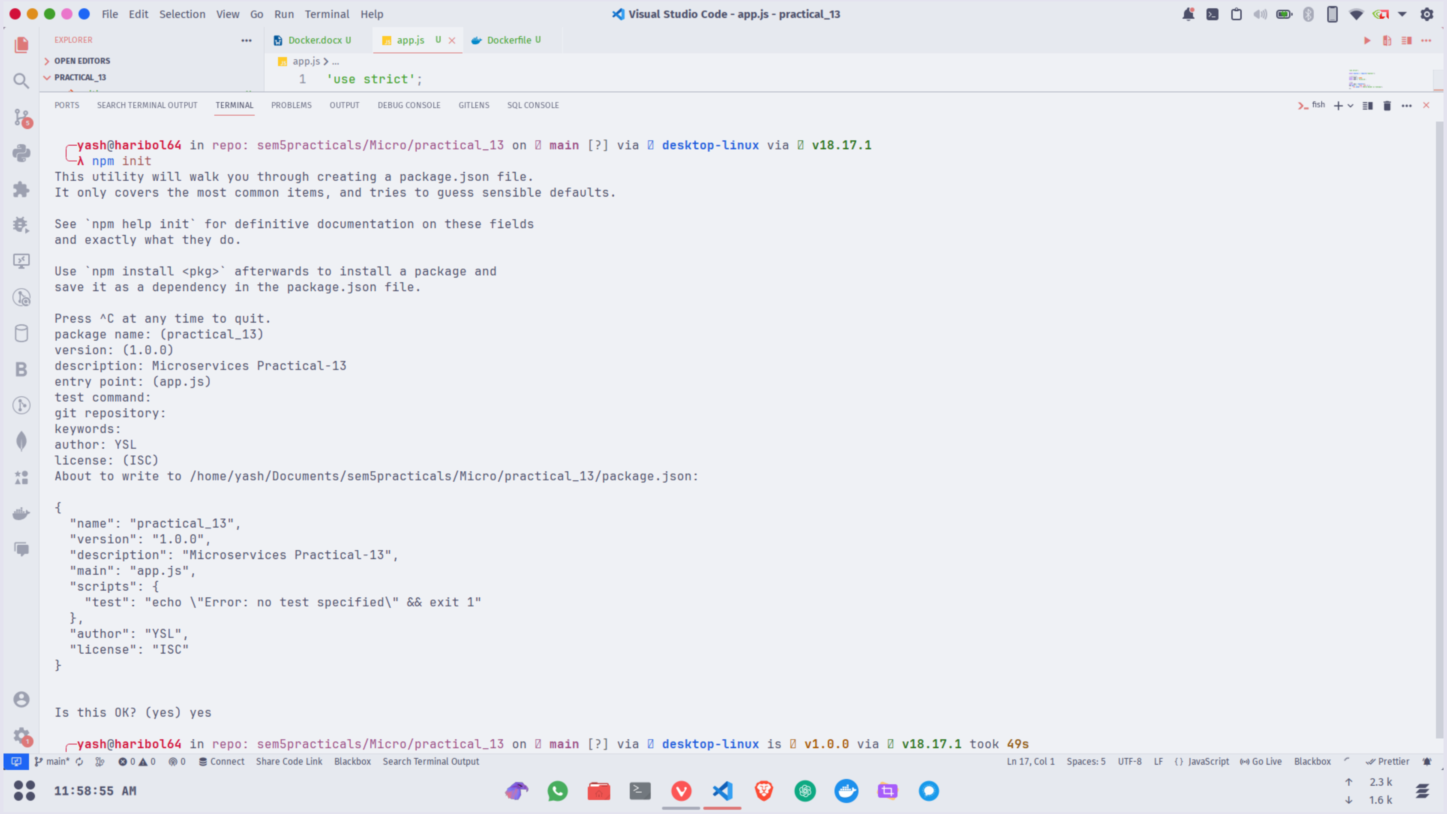
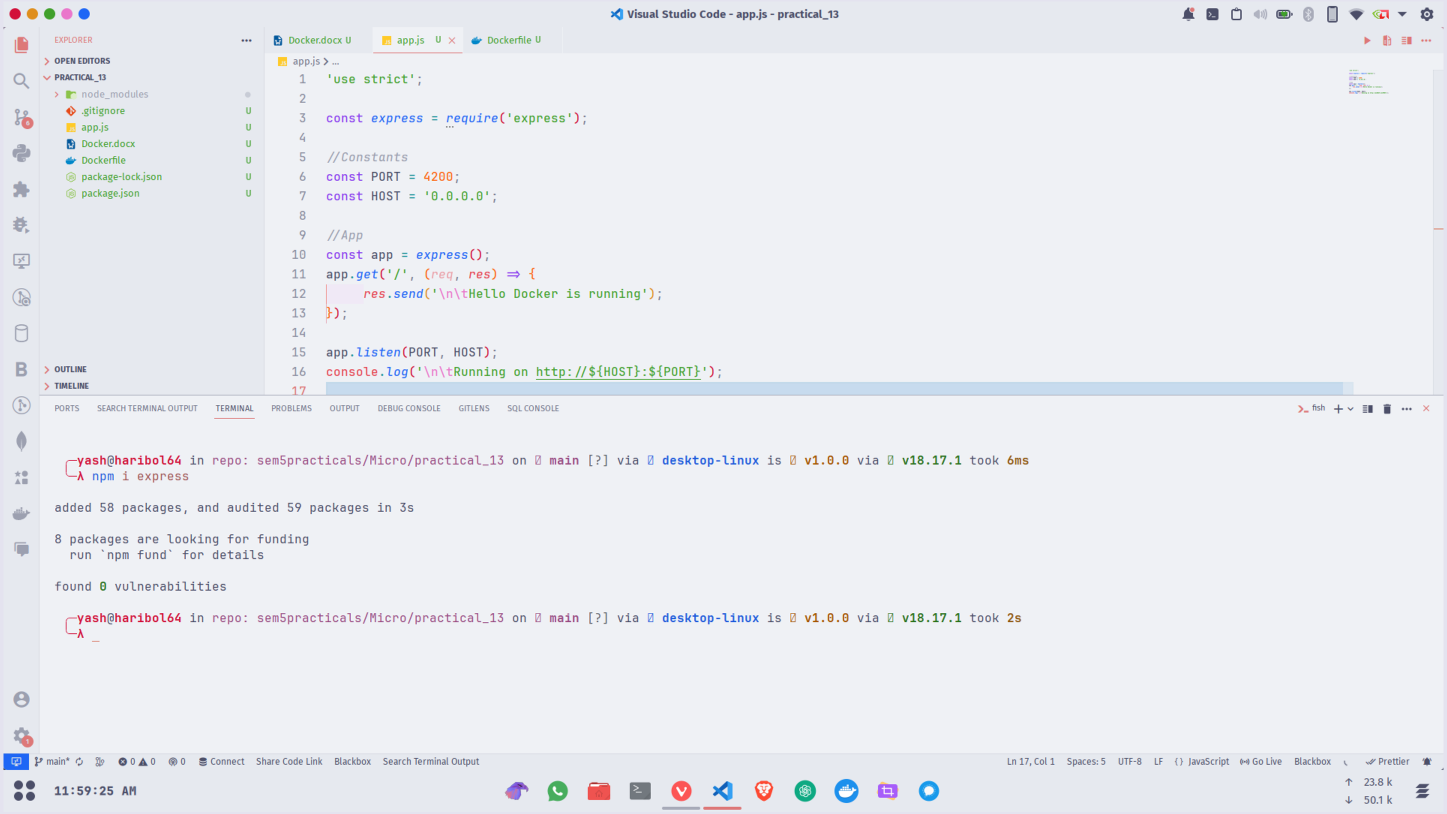

Visual Studio Code - app.js - practical_13
File Edit Selection View Go Run Terminal Help
EXPLORER
OPEN EDITORS
PRACTICAL_13
Docker.docx U
app.js U
Dockerfile U
PORTS SEARCH TERMINAL OUTPUT TERMINAL PROBLEMS OUTPUT DEBUG CONSOLE GITLENS SQL CONSOLE
fish
main* Connect Share Code Link Blackbox Search Terminal Output
Ln 17, Col 1 Spaces: 5 UTF-8 LF {} JavaScript Go Live Blackbox Prettier
11:58:55 AM
2.3 k
1.6 k

```
1  'use strict';
```

```
┌yash@haribol64 in repo: sem5practicals/Micro/practical_13 on ▯ main [?] via ▯ desktop-linux via ▯ v18.17.1
└λ 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: (practical_13)
version: (1.0.0)
description: Microservices Practical-13
entry point: (app.js)
test command:
git repository:
keywords:
author: YSL
license: (ISC)
About to write to /home/yash/Documents/sem5practicals/Micro/practical_13/package.json:

{
  "name": "practical_13",
  "version": "1.0.0",
  "description": "Microservices Practical-13",
  "main": "app.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "author": "YSL",
  "license": "ISC"
}


Is this OK? (yes) yes

┌yash@haribol64 in repo: sem5practicals/Micro/practical_13 on ▯ main [?] via ▯ desktop-linux is ▯ v1.0.0 via ▯ v18.17.1 took 49s
```


Visual Studio Code - app.js - practical_13
EXPLORER
OPEN EDITORS
PRACTICAL_13
node_modules
.gitignore U
app.js U
Docker.docx U
Dockerfile U
package-lock.json U
package.json U
OUTLINE
TIMELINE
Docker.docx U
app.js U
Dockerfile U
PORTS SEARCH TERMINAL OUTPUT TERMINAL PROBLEMS OUTPUT DEBUG CONSOLE GITLENS SQL CONSOLE
fish
main* Connect Share Code Link Blackbox Search Terminal Output
Ln 17, Col 1 Spaces: 5 UTF-8 LF {} JavaScript Go Live Blackbox Prettier
11:59:25 AM
23.8 k
50.1 k

```javascript
'use strict';

const express = require('express');

//Constants
const PORT = 4200;
const HOST = '0.0.0.0';

//App
const app = express();
app.get('/', (req, res) => {
        res.send('\n\tHello Docker is running');
});

app.listen(PORT, HOST);
console.log('\n\tRunning on http://${HOST}:${PORT}');

```

```
┌yash@haribol64 in repo: sem5practicals/Micro/practical_13 on ▯ main [?] via ▯ desktop-linux is ▯ v1.0.0 via ▯ v18.17.1 took 6ms
└λ npm i express

added 58 packages, and audited 59 packages in 3s

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

found 0 vulnerabilities

┌yash@haribol64 in repo: sem5practicals/Micro/practical_13 on ▯ main [?] via ▯ desktop-linux is ▯ v1.0.0 via ▯ v18.17.1 took 2s
└λ _
```

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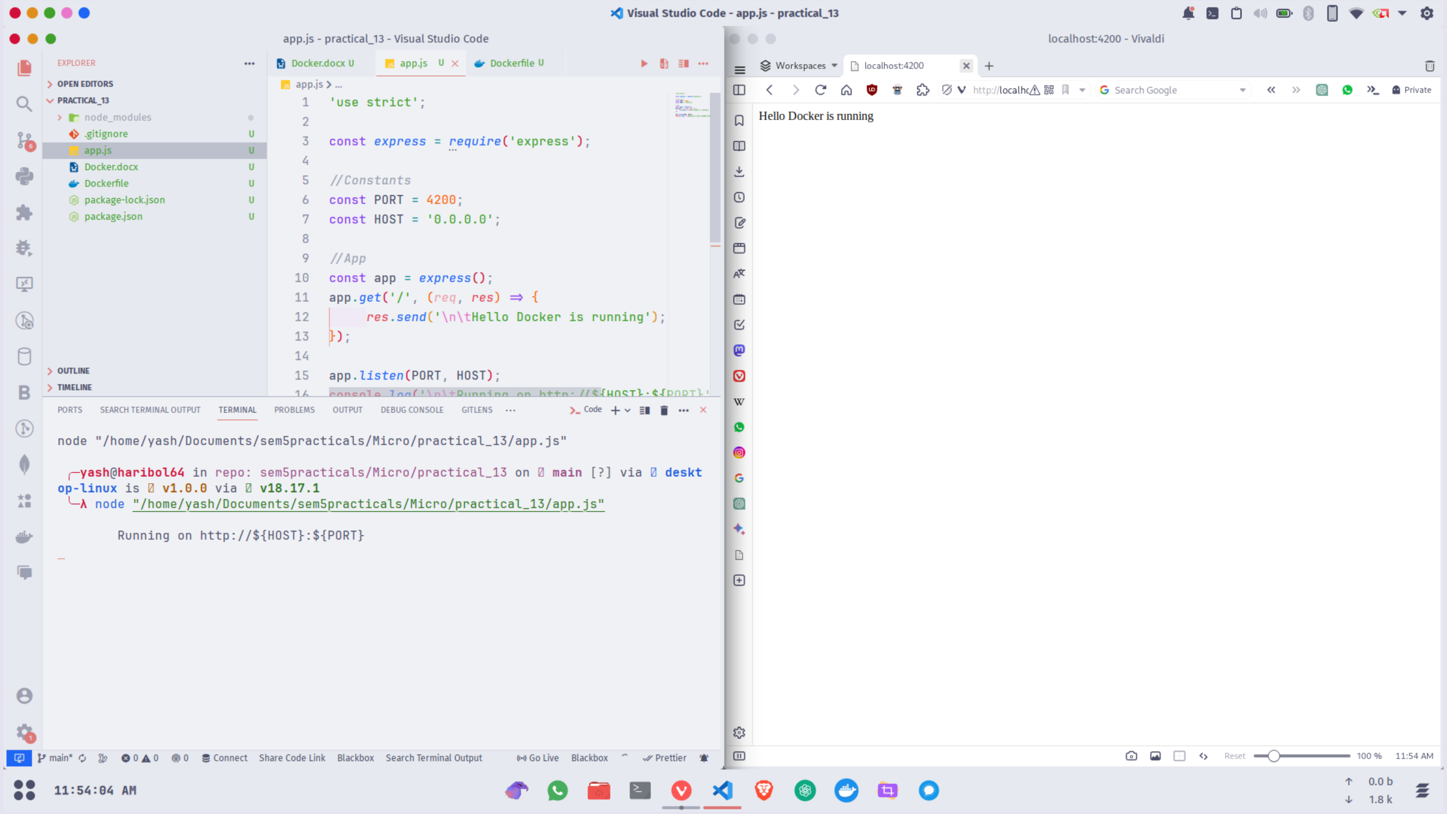

```
'use strict';

const express = require('express');

//Constants
const PORT = 4200;
const HOST = '0.0.0.0';

//App
const app = express();
app.get('/', (req, res) => {
	res.send('\n\tHello Docker is running');
});

app.listen(PORT, HOST);
console.log('\n\tRunning on http://${HOST}:${PORT}'
```

```
node "/home/yash/Documents/sem5practicals/Micro/practical_13/app.js"

╭─yash@haribol64 in repo: sem5practicals/Micro/practical_13 on □ main [?] via □ deskt
op-linux is □ v1.0.0 via □ v18.17.1
╰─λ node "/home/yash/Documents/sem5practicals/Micro/practical_13/app.js"

        Running on http://${HOST}:${PORT}
```

Hello Docker is running

2. Build a Docker image for that application.

Dockerfile :

```
# Base Image
FROM node:14-alpine


# Create app directory
WORKDIR /usr/src/app


# Install app dependencies
COPY package*.json ./
```

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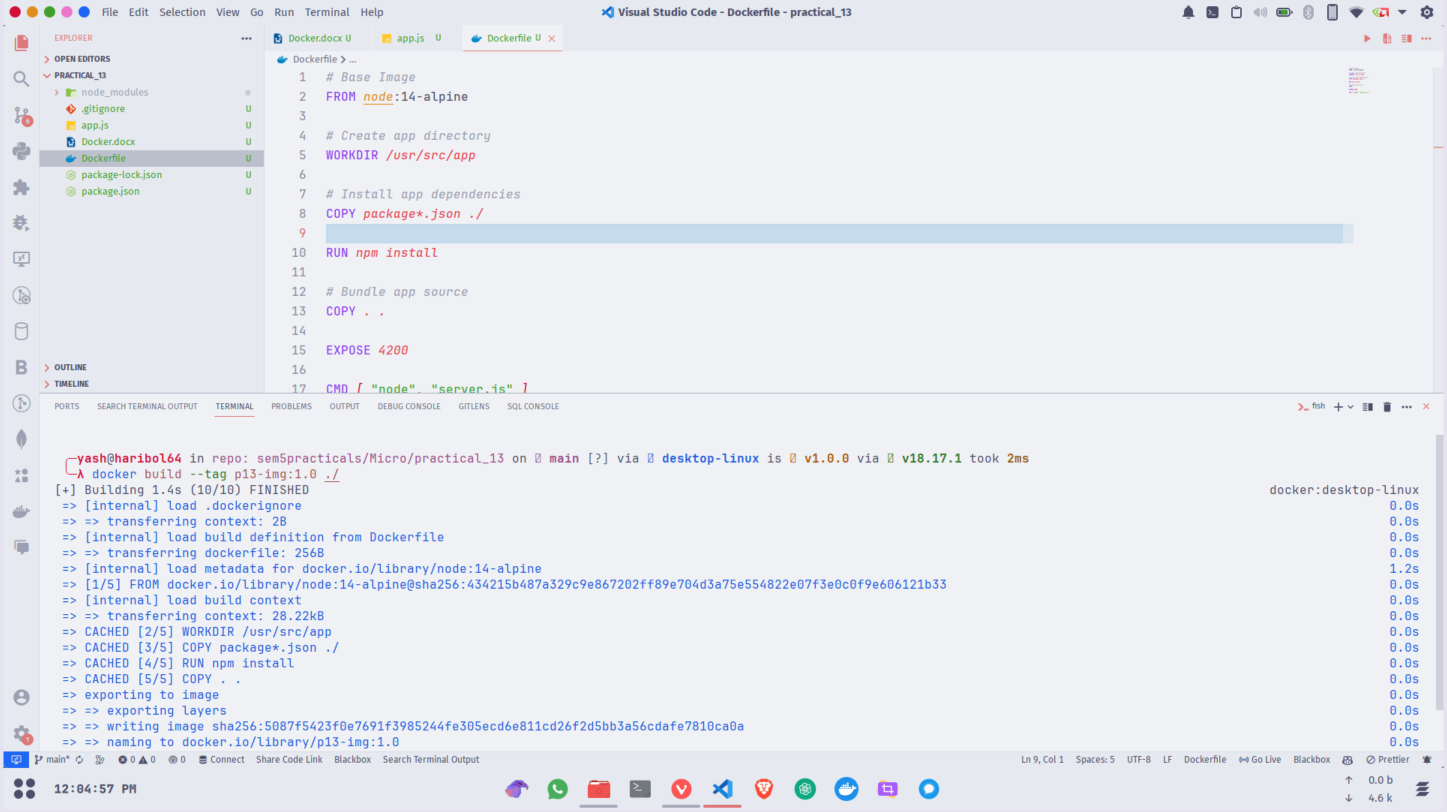
```
RUN npm install


# Bundle app source

COPY . .


EXPOSE 4200


CMD [ "node", "server.js" ]
```



```
# Base Image
FROM node:14-alpine

# Create app directory
WORKDIR /usr/src/app

# Install app dependencies
COPY package*.json ./

RUN npm install

# Bundle app source
COPY . .

EXPOSE 4200

CMD [ "node", "server.js" ]
```

```
╭─yash@haribol64 in repo: sem5practicals/Micro/practical_13 on  main [?] via  desktop-linux is  v1.0.0 via  v18.17.1 took 2ms
╰─λ docker build --tag p13-img:1.0 ./
[+] Building 1.4s (10/10) FINISHED                                                                   docker:desktop-linux
 => [internal] load .dockerignore                                                                                    0.0s
 => => transferring context: 2B                                                                                      0.0s
 => [internal] load build definition from Dockerfile                                                                 0.0s
 => => transferring dockerfile: 256B                                                                                 0.0s
 => [internal] load metadata for docker.io/library/node:14-alpine                                                    1.2s
 => [1/5] FROM docker.io/library/node:14-alpine@sha256:434215b487a329c9e867202ff89e704d3a75e554822e07f3e0c0f9e606121b33  0.0s
 => [internal] load build context                                                                                    0.0s
 => => transferring context: 28.22kB                                                                                 0.0s
 => CACHED [2/5] WORKDIR /usr/src/app                                                                                0.0s
 => CACHED [3/5] COPY package*.json ./                                                                               0.0s
 => CACHED [4/5] RUN npm install                                                                                     0.0s
 => CACHED [5/5] COPY . .                                                                                            0.0s
 => exporting to image                                                                                               0.0s
 => => exporting layers                                                                                              0.0s
 => => writing image sha256:5087f5423f0e7691f3985244fe305ecd6e811cd26f2d5bb3a56cdafe7810ca0a                         0.0s
 => => naming to docker.io/library/p13-img:1.0                                                                       0.0s
```

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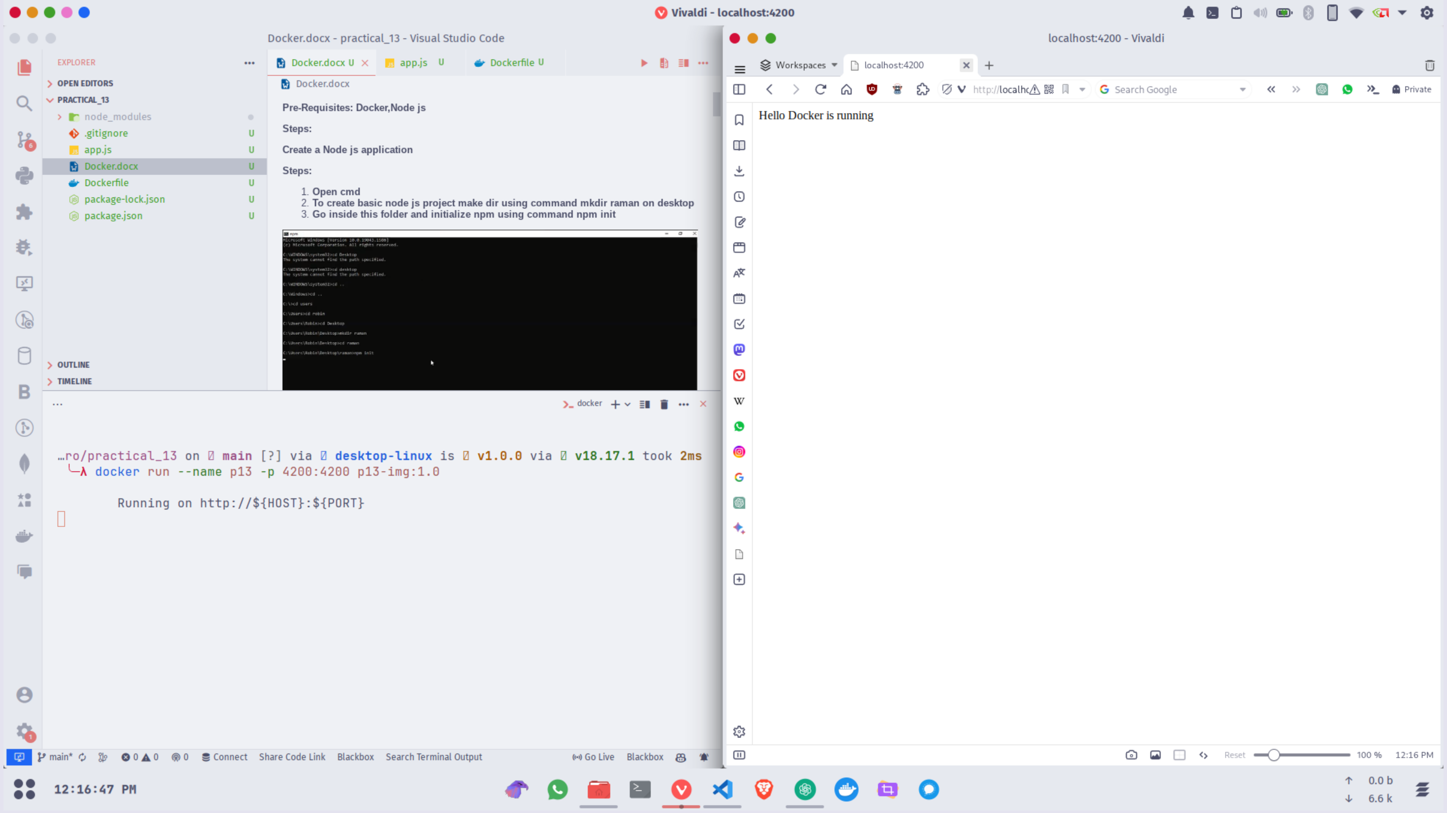
3. Instantiate a container from that image.



Docker.docx

Pre-Requisites: Docker,Node js

Steps:

Create a Node js application

Steps:

1. Open cmd
2. To create basic node js project make dir using command mkdir raman on desktop
3. Go inside this folder and initialize npm using command npm init

```
Microsoft Windows [Version 10.0.19043.1586]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd Desktop
The system cannot find the path specified.

C:\WINDOWS\system32>cd desktop
The system cannot find the path specified.

C:\WINDOWS\system32>cd ..

C:\Windows>cd ..

C:\>cd users

C:\Users>cd robin

C:\Users\Robin>cd Desktop

C:\Users\Robin\Desktop>mkdir raman

C:\Users\Robin\Desktop>cd raman

C:\Users\Robin\Desktop\raman>npm init
```

```
…ro/practical_13 on  main [?] via  desktop-linux is  v1.0.0 via  v18.17.1 took 2ms
 └─λ docker run --name p13 -p 4200:4200 p13-img:1.0

        Running on http://${HOST}:${PORT}
```

Hello Docker is running

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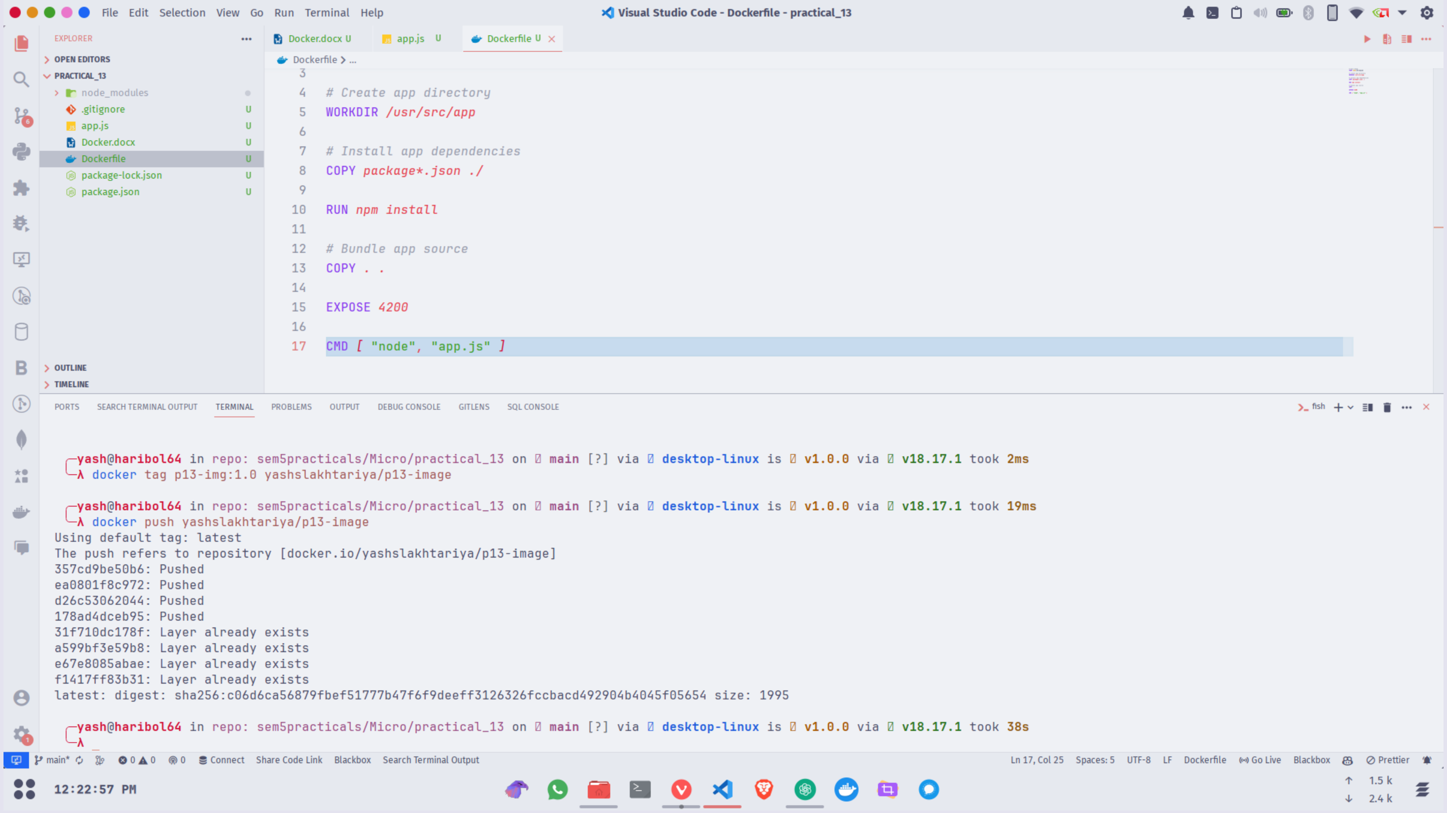
4. Push the image to Docker Hub



```
# Create app directory
WORKDIR /usr/src/app

# Install app dependencies
COPY package*.json ./

RUN npm install

# Bundle app source
COPY . .

EXPOSE 4200

CMD [ "node", "app.js" ]
```

```
┌yash@haribol64 in repo: sem5practicals/Micro/practical_13 on ▯ main [?] via ▯ desktop-linux is ▯ v1.0.0 via ▯ v18.17.1 took 2ms
└λ docker tag p13-img:1.0 yashslakhtariya/p13-image

┌yash@haribol64 in repo: sem5practicals/Micro/practical_13 on ▯ main [?] via ▯ desktop-linux is ▯ v1.0.0 via ▯ v18.17.1 took 19ms
└λ docker push yashslakhtariya/p13-image
Using default tag: latest
The push refers to repository [docker.io/yashslakhtariya/p13-image]
357cd9be50b6: Pushed
ea0801f8c972: Pushed
d26c53062044: Pushed
178ad4dceb95: Pushed
31f710dc178f: Layer already exists
a599bf3e59b8: Layer already exists
e67e8085abae: Layer already exists
f1417ff83b31: Layer already exists
latest: digest: sha256:c06d6ca56879fbef51777b47f6f9deeff3126326fccbacd492904b4045f05654 size: 1995

┌yash@haribol64 in repo: sem5practicals/Micro/practical_13 on ▯ main [?] via ▯ desktop-linux is ▯ v1.0.0 via ▯ v18.17.1 took 38s
└λ _
```

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5. Create an application to render static HTML content and containerize it

Docker file :

```
# Base Image
FROM node:14-alpine

# Create app directory
WORKDIR /usr/src/app

# Install app dependencies
COPY package*.json ./

RUN npm install

# Bundle app source
COPY . .

EXPOSE 4201

CMD [ "node", "bulb_buttons.js" ]
```

JS file :

```
let express = require("express");
let app = express();
let port = 4200;


app.use(express.static(__dirname + "/bulb_buttons"));


app.listen(port, function () {
console.log(`\nServer is being started on ${port}`);
});
```

HTML file :

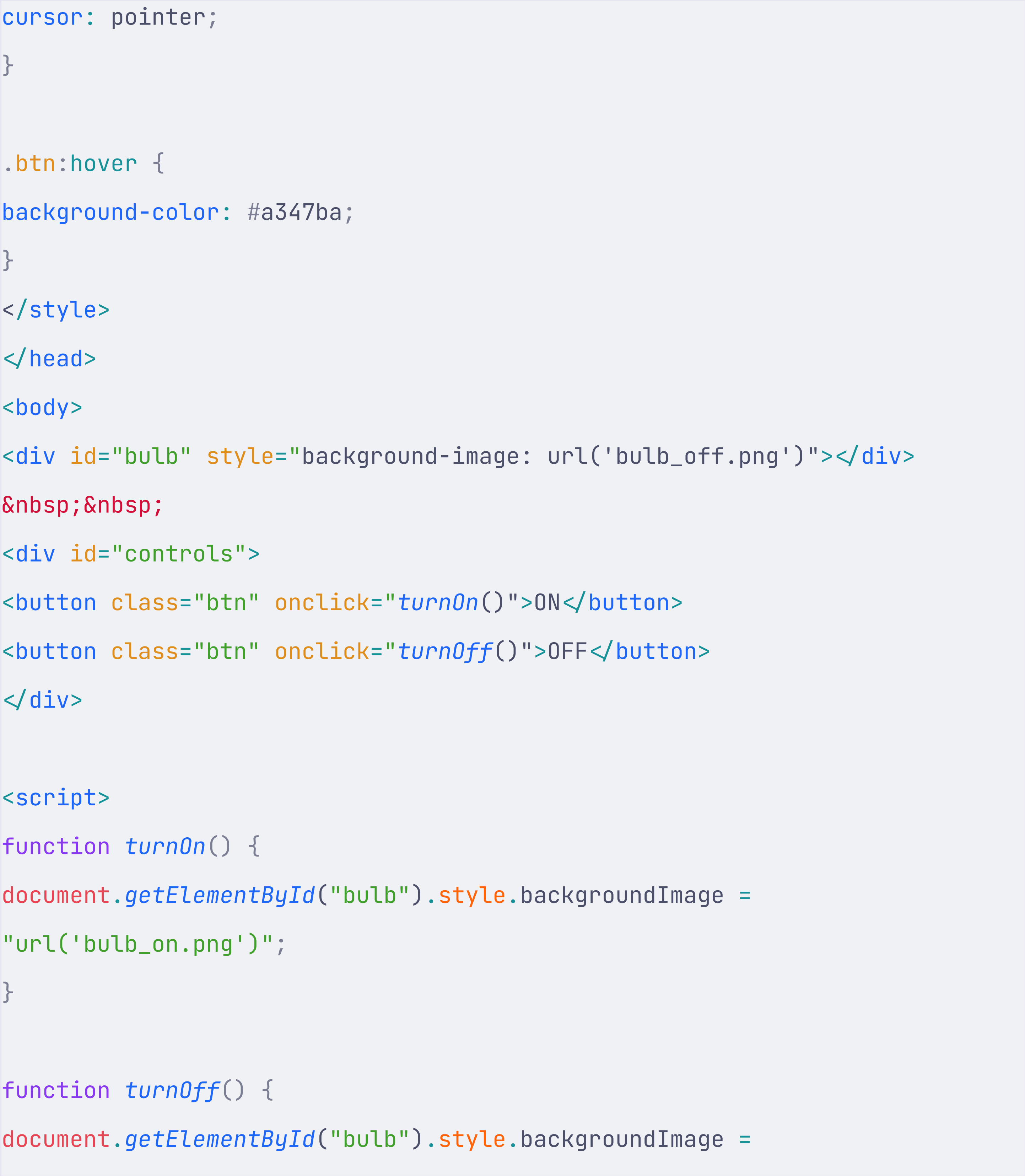
```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8" />
<meta name="viewport" content="width=device-width, initial-scale=1.0" />
<title>YSL Light Bulb</title>
<style>
body {
display: flex;
flex-direction: column;
align-items: center;
justify-content: center;
height: 100vh;
margin: 0;
```

```css
background-color: #ffffff;
}

#bulb {
width: 400px;
height: 400px;
background-size: cover;
background-repeat: no-repeat;
}

#controls {
display: flex;
justify-content: center;
margin-top: 20px;
}

.btn {
margin: 0 10px;
padding: 10px 15px;
font-size: 22px;
background-color: #5e81cc;
color: #ffffff;
border: none;
border-radius: 16px;
```



```
cursor: pointer;
}

.btn:hover {
background-color: #a347ba;
}
</style>
</head>
<body>
<div id="bulb" style="background-image: url('bulb_off.png')"></div>
&nbsp;&nbsp;
<div id="controls">
<button class="btn" onclick="turnOn()">ON</button>
<button class="btn" onclick="turnOff()">OFF</button>
</div>

<script>
function turnOn() {
document.getElementById("bulb").style.backgroundImage =
"url('bulb_on.png')";
}

function turnOff() {
document.getElementById("bulb").style.backgroundImage =
```

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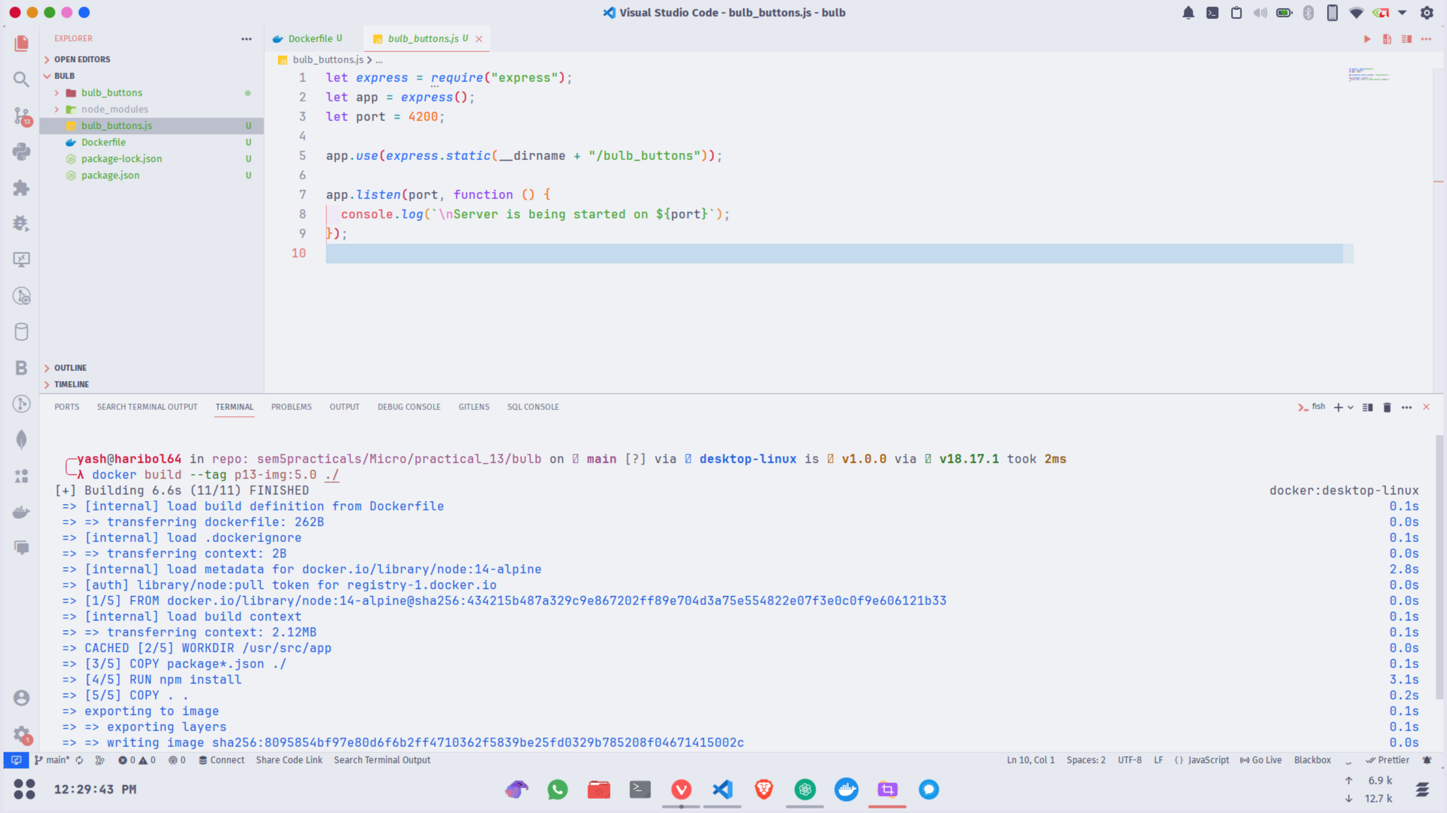
```
"url('bulb_off.png')";

}

</script>

</body>

</html>
```



```
let express = require("express");
let app = express();
let port = 4200;

app.use(express.static(__dirname + "/bulb_buttons"));

app.listen(port, function () {
  console.log(`\nServer is being started on ${port}`);
});

```

```
┌yash@haribol64 in repo: sem5practicals/Micro/practical_13/bulb on ▯ main [?] via ▯ desktop-linux is ▯ v1.0.0 via ▯ v18.17.1 took 2ms
└λ docker build --tag p13-img:5.0 ./
[+] Building 6.6s (11/11) FINISHED                                                                                   docker:desktop-linux
 => [internal] load build definition from Dockerfile                                                                                 0.1s
 => => transferring dockerfile: 262B                                                                                                 0.0s
 => [internal] load .dockerignore                                                                                                    0.1s
 => => transferring context: 2B                                                                                                      0.0s
 => [internal] load metadata for docker.io/library/node:14-alpine                                                                    2.8s
 => [auth] library/node:pull token for registry-1.docker.io                                                                          0.0s
 => [1/5] FROM docker.io/library/node:14-alpine@sha256:434215b487a329c9e867202ff89e704d3a75e554822e07f3e0c0f9e606121b33              0.0s
 => [internal] load build context                                                                                                    0.1s
 => => transferring context: 2.12MB                                                                                                  0.1s
 => CACHED [2/5] WORKDIR /usr/src/app                                                                                                0.0s
 => [3/5] COPY package*.json ./                                                                                                      0.1s
 => [4/5] RUN npm install                                                                                                            3.1s
 => [5/5] COPY . .                                                                                                                   0.2s
 => exporting to image                                                                                                               0.1s
 => => exporting layers                                                                                                              0.1s
 => => writing image sha256:8095854bf97e80d6f6b2ff4710362f5839be25fd0329b785208f04671415002c                                         0.0s
```

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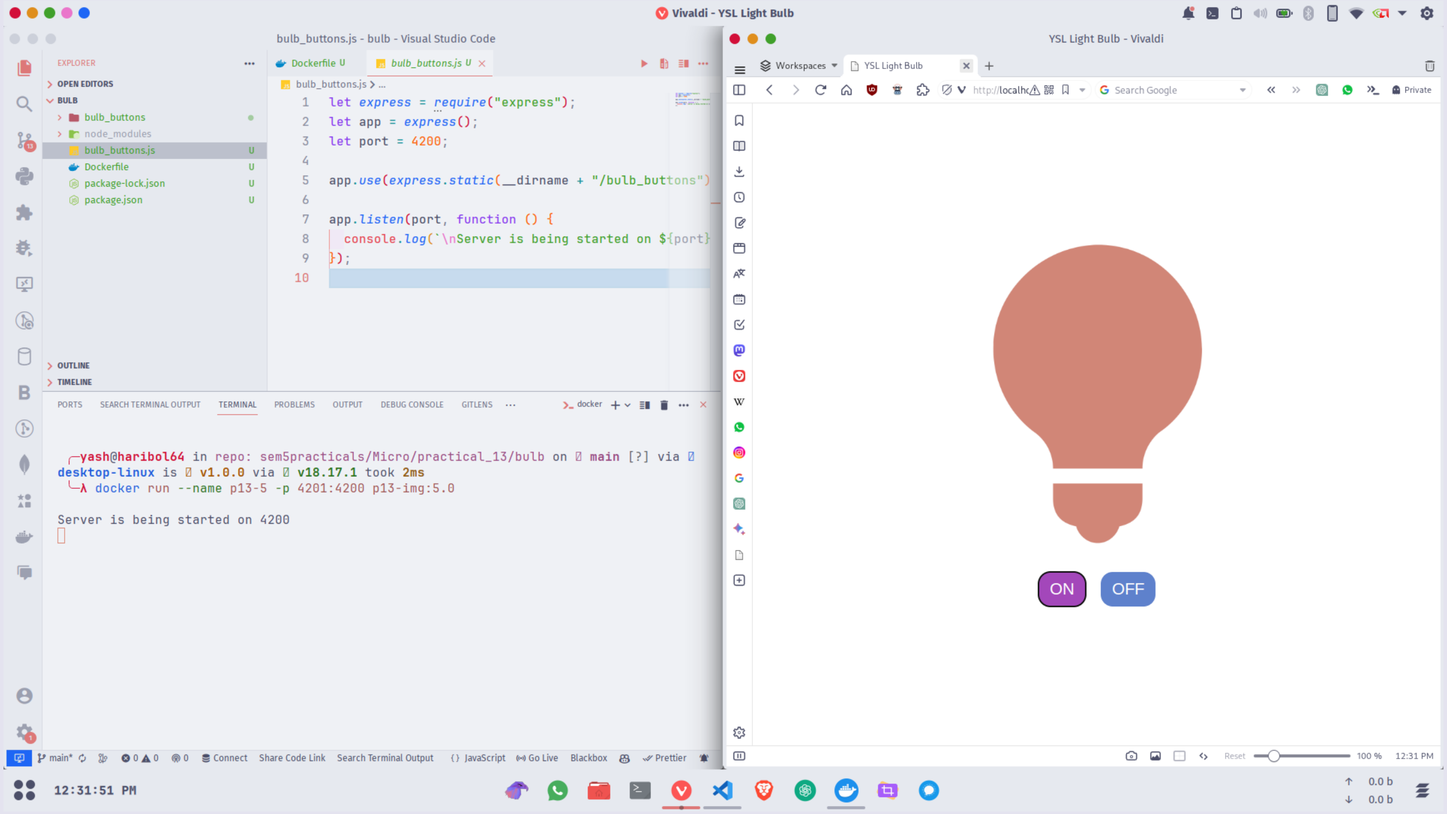

bulb_buttons.js - bulb - Visual Studio Code

```
let express = require("express");
let app = express();
let port = 4200;

app.use(express.static(__dirname + "/bulb_buttons")
      
app.listen(port, function () {
  console.log(`\nServer is being started on ${port}
});
```

```
╭─yash@haribol64 in repo: sem5practicals/Micro/practical_13/bulb on  main [?] via 
desktop-linux is  v1.0.0 via  v18.17.1 took 2ms
╰─λ docker run --name p13-5 -p 4201:4200 p13-img:5.0

Server is being started on 4200
```