Lesson 04 Demo 04

Demonstrating Programmatic Navigation in a React Application

Objective: To demonstrate programmatic navigation in a React application for efficient user redirection and improved navigation experience

Tools required: Visual Studio Code and Node.js

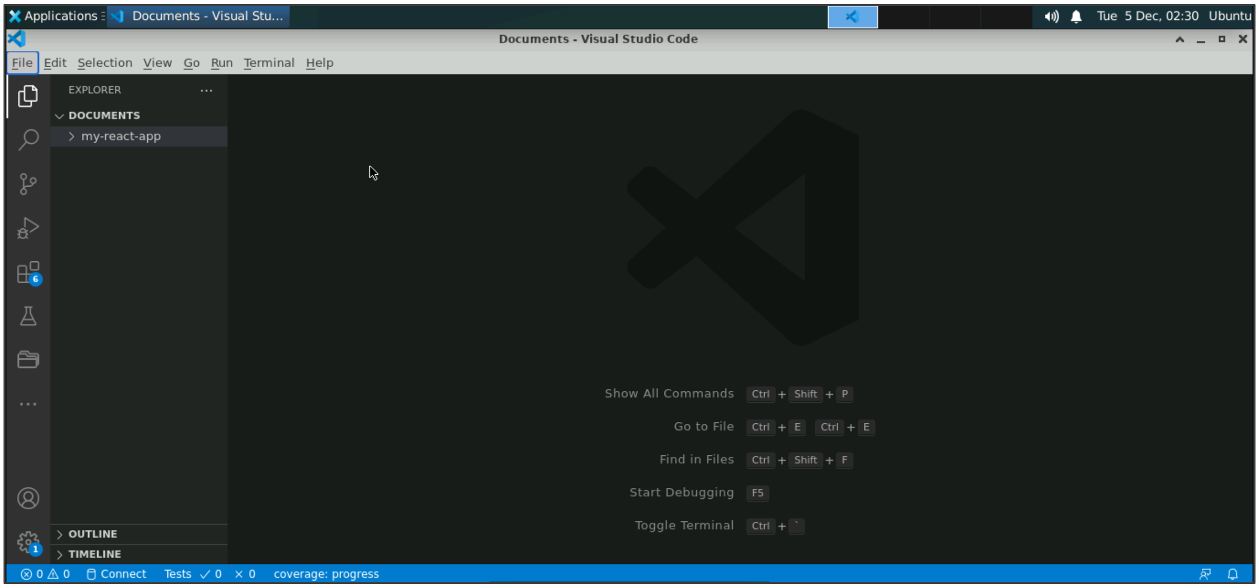
Prerequisites: A basic understanding of programmatic navigation in React Router

Steps to be followed:

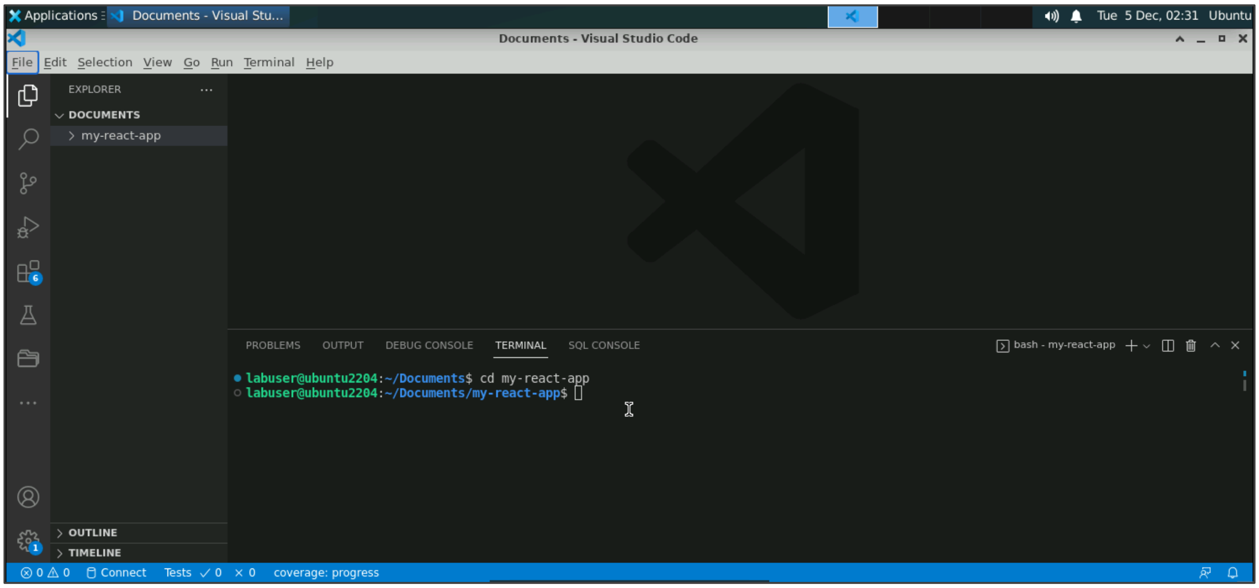
1. Set up a new React app
2. Install React Router
3. Create component files
4. Create programmatic navigation
5. Run the application

Step 1: Set up a new React app

1.1 Open **Visual Studio Code** and create a new folder named **my-react-app**

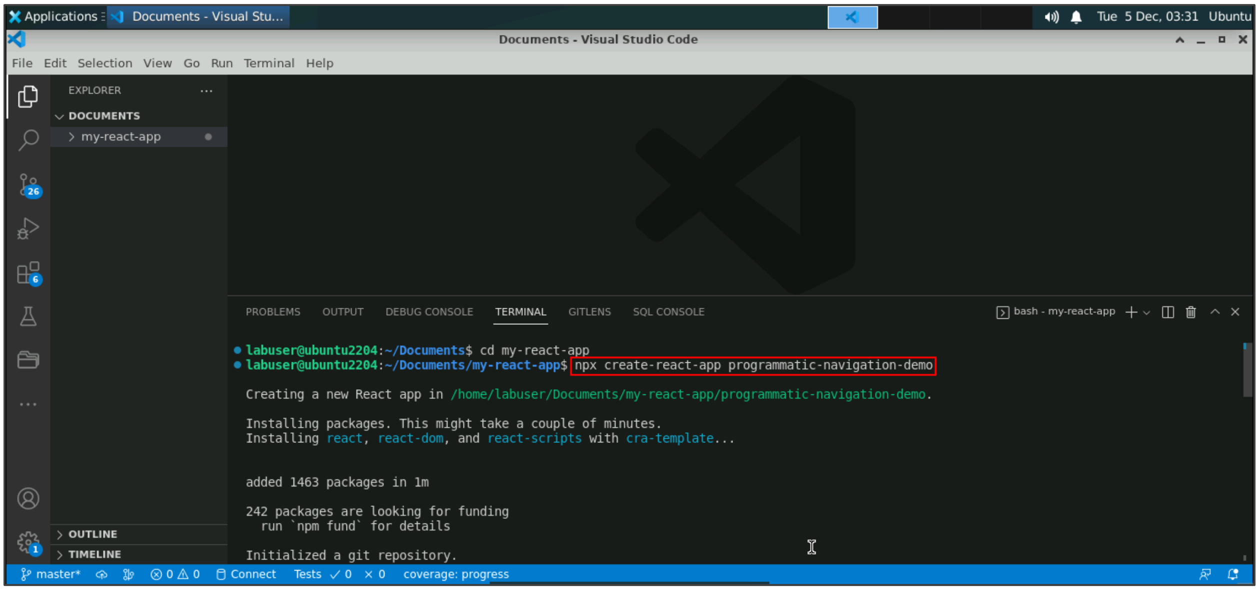

Applications
Documents - Visual Stu...
Tue 5 Dec, 02:30 Ubuntu
Documents - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
DOCUMENTS
my-react-app
OUTLINE
TIMELINE
Show All Commands Ctrl + Shift + P
Go to File Ctrl + E Ctrl + E
Find in Files Ctrl + Shift + F
Start Debugging F5
Toggle Terminal Ctrl + `
0 0 Connect Tests 0 0 coverage: progress

1.2 Open the terminal and navigate to the **my-react-app** folder using the following command:
cd my-react-app


Applications
Documents - Visual Stu...
Tue 5 Dec, 02:31 Ubuntu
Documents - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
DOCUMENTS
my-react-app
OUTLINE
TIMELINE
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL SQL CONSOLE
bash - my-react-app
0 0 Connect Tests 0 0 coverage: progress

```
labuser@ubuntu2204:~/Documents$ cd my-react-app
labuser@ubuntu2204:~/Documents/my-react-app$ 
```

1.3 Initialize a new React app using the following command:
npx create-react-app programmatic-navigation-demo


Applications
Documents - Visual Stu...
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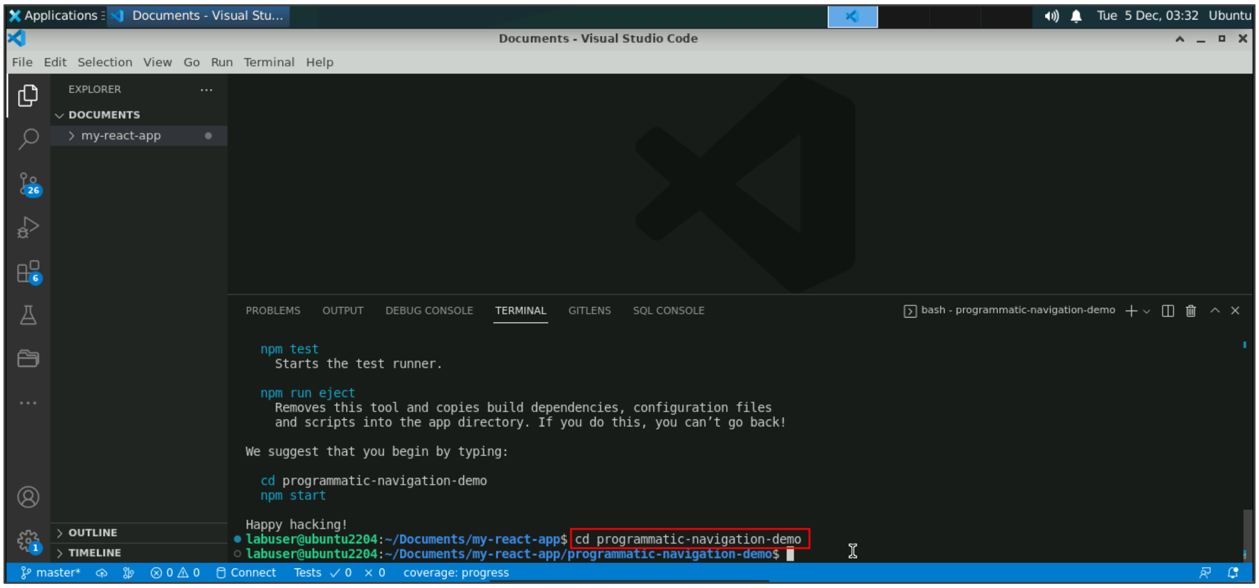
File Edit Selection View Go Run Terminal Help
EXPLORER
DOCUMENTS
my-react-app
OUTLINE
TIMELINE
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL GITLENS SQL CONSOLE
bash - my-react-app
master* 0 0 Connect Tests 0 0 coverage: progress

```
labuser@ubuntu2204:~/Documents$ cd my-react-app
labuser@ubuntu2204:~/Documents/my-react-app$ npx create-react-app programmatic-navigation-demo

Creating a new React app in /home/labuser/Documents/my-react-app/programmatic-navigation-demo.

Installing packages. This might take a couple of minutes.
Installing react, react-dom, and react-scripts with cra-template...


added 1463 packages in 1m

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

Initialized a git repository.
```

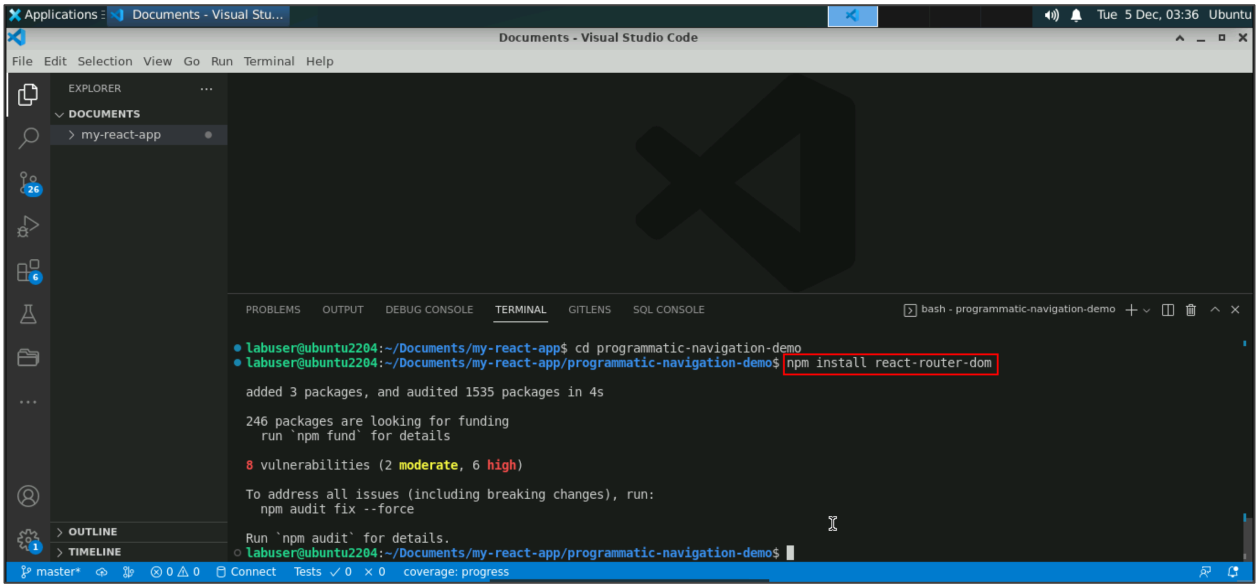
1.4 Navigate to the **programmatic-navigation-demo** folder using the following command:
cd programmatic-navigation-demo


Applications
Documents - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
DOCUMENTS
my-react-app
OUTLINE
TIMELINE
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL GITLENS SQL CONSOLE
bash - programmatic-navigation-demo
master* ⊗ 0 ⚠ 0 Connect Tests ✓ 0 × 0 coverage: progress

```
  npm test
    Starts the test runner.

  npm run eject
    Removes this tool and copies build dependencies, configuration files
    and scripts into the app directory. If you do this, you can’t go back!

We suggest that you begin by typing:

  cd programmatic-navigation-demo
  npm start

Happy hacking!
labuser@ubuntu2204:~/Documents/my-react-app$ cd programmatic-navigation-demo
labuser@ubuntu2204:~/Documents/my-react-app/programmatic-navigation-demo$
```

Step 2: Install React Router

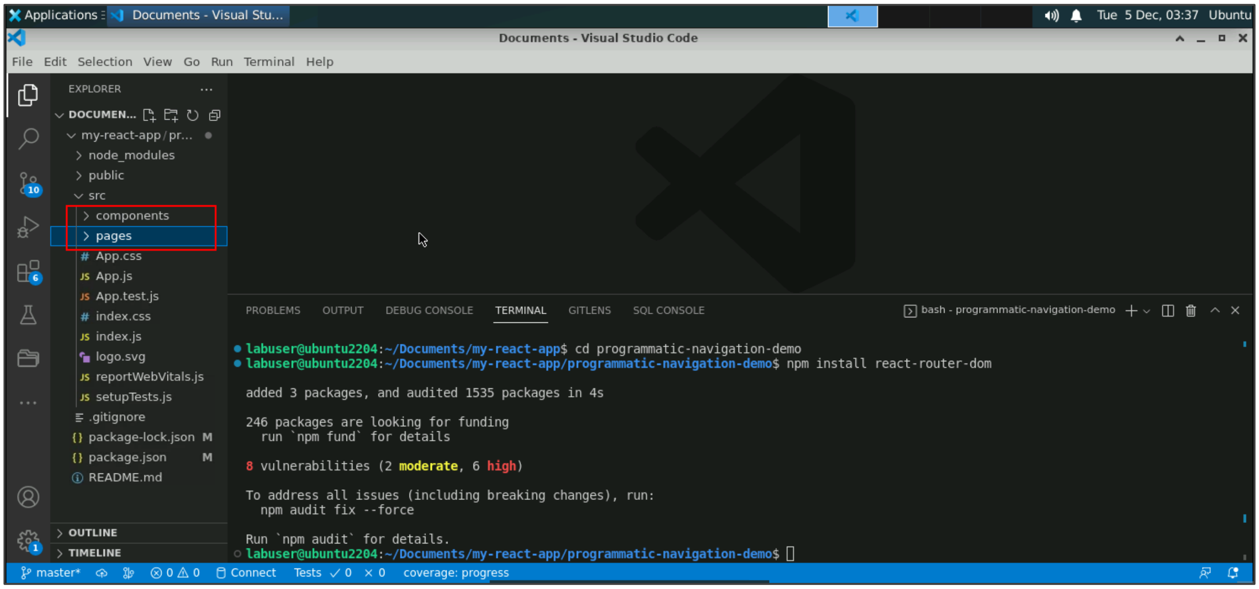
2.1 Install React router using the following command:
npm install react-router-dom


Applications
Documents - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
DOCUMENTS
my-react-app
OUTLINE
TIMELINE
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL GITLENS SQL CONSOLE
bash - programmatic-navigation-demo
master* ⊗ 0 ⚠ 0 Connect Tests ✓ 0 × 0 coverage: progress

```
labuser@ubuntu2204:~/Documents/my-react-app$ cd programmatic-navigation-demo
labuser@ubuntu2204:~/Documents/my-react-app/programmatic-navigation-demo$ npm install react-router-dom

added 3 packages, and audited 1535 packages in 4s

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

8 vulnerabilities (2 moderate, 6 high)

To address all issues (including breaking changes), run:
  npm audit fix --force

Run `npm audit` for details.
labuser@ubuntu2204:~/Documents/my-react-app/programmatic-navigation-demo$
```

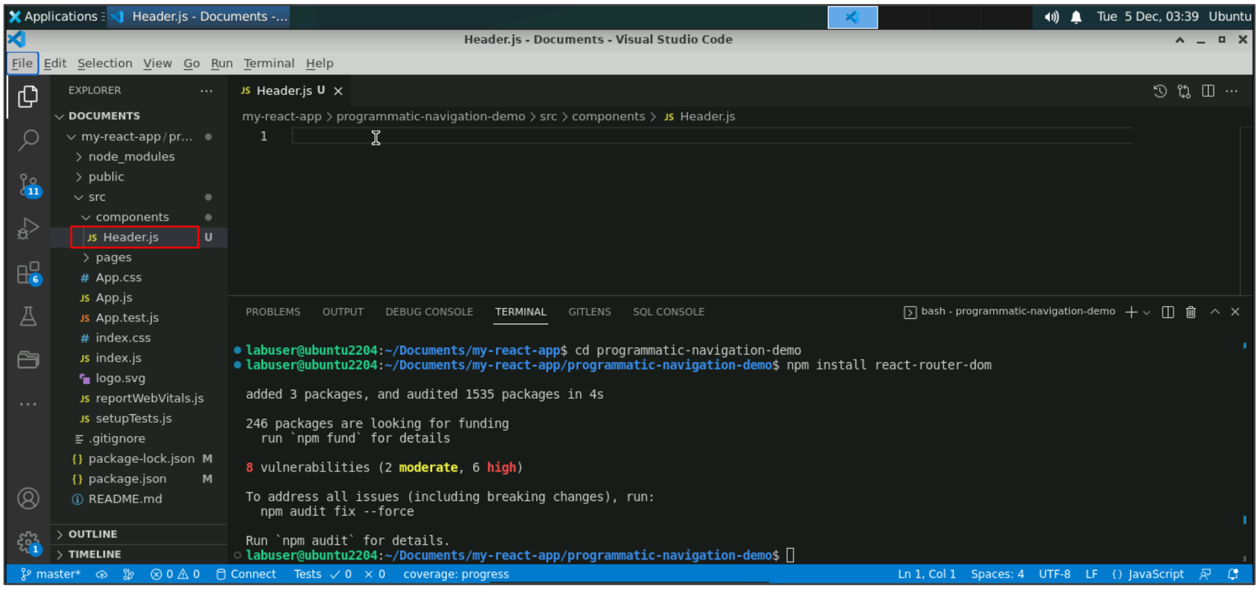
Step 3: Create component files

3.1 In the **src** folder, create two new folders named **components** and **pages**



```
labuser@ubuntu2204:~/Documents/my-react-app$ cd programmatic-navigation-demo
labuser@ubuntu2204:~/Documents/my-react-app/programmatic-navigation-demo$ npm install react-router-dom

added 3 packages, and audited 1535 packages in 4s

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

8 vulnerabilities (2 moderate, 6 high)

To address all issues (including breaking changes), run:
  npm audit fix --force

Run `npm audit` for details.
labuser@ubuntu2204:~/Documents/my-react-app/programmatic-navigation-demo$
```

3.2 Inside the **components** folder, create a new JavaScript file named **Header.js**


Applications
Header.js - Documents - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
DOCUMENTS
my-react-app / pr...
node_modules
public
src
components
Header.js U
pages
App.css
App.js
App.test.js
index.css
index.js
logo.svg
reportWebVitals.js
setupTests.js
.gitignore
package-lock.json M
package.json M
README.md
OUTLINE
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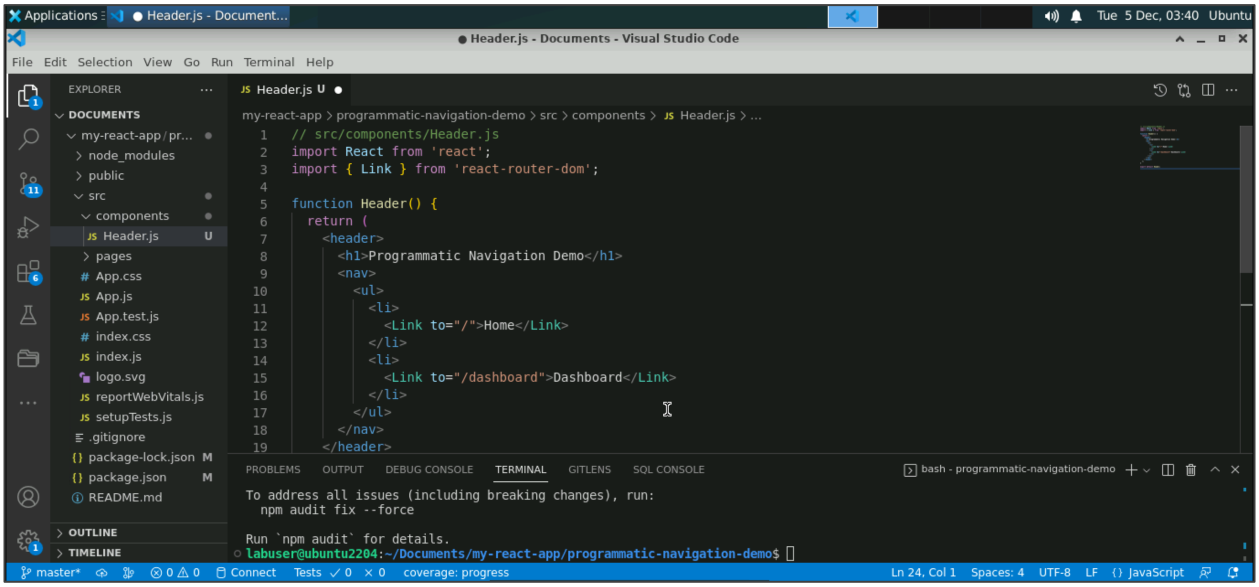
Header.js U
my-react-app > programmatic-navigation-demo > src > components > Header.js
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL GITLENS SQL CONSOLE
bash - programmatic-navigation-demo
master* Connect Tests coverage: progress
Ln 1, Col 1 Spaces: 4 UTF-8 LF JavaScript

```
labuser@ubuntu2204:~/Documents/my-react-app$ cd programmatic-navigation-demo
labuser@ubuntu2204:~/Documents/my-react-app/programmatic-navigation-demo$ npm install react-router-dom

added 3 packages, and audited 1535 packages in 4s

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

8 vulnerabilities (2 moderate, 6 high)

To address all issues (including breaking changes), run:
  npm audit fix --force

Run `npm audit` for details.
labuser@ubuntu2204:~/Documents/my-react-app/programmatic-navigation-demo$
```

3.3 Add the following code to the **Header.js** file:

```
// src/components/Header.js
import React from 'react';
import { Link } from 'react-router-dom';

function Header() {
  return (
    <header>
      <h1>Programmatic Navigation Demo</h1>
      <nav>
        <ul>
          <li>
            <Link to="/">Home</Link>
          </li>
          <li>
            <Link to="/dashboard">Dashboard</Link>
          </li>
        </ul>
      </nav>
    </header>
  );
}

export default Header;
```


Applications
Header.js - Document...
Tue 5 Dec, 03:40 Ubuntu
● Header.js - Documents - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
Header.js U ●
my-react-app > programmatic-navigation-demo > src > components > Header.js > ...
DOCUMENTS
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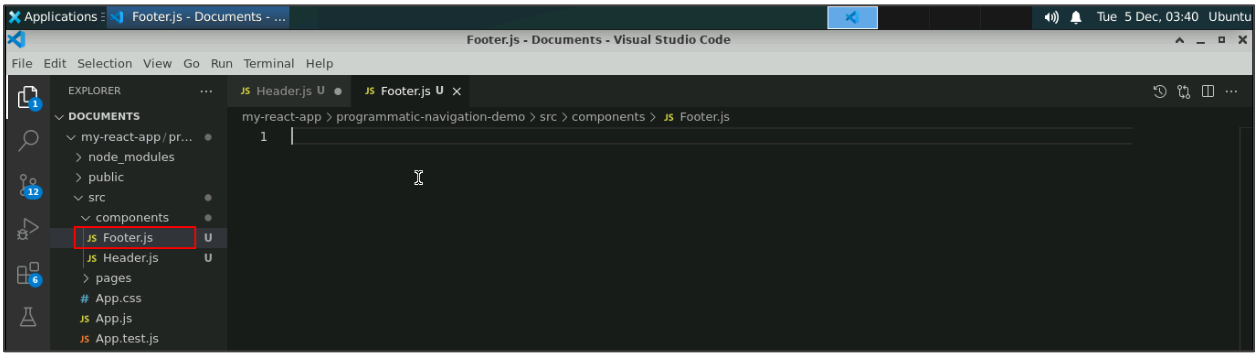
node_modules
public
src
components
Header.js U
pages
App.css
App.js
App.test.js
index.css
index.js
logo.svg
reportWebVitals.js
setupTests.js
.gitignore
package-lock.json M
package.json M
README.md
OUTLINE
TIMELINE
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL GITLENS SQL CONSOLE
bash - programmatic-navigation-demo
master* ⊗ 0 ⚠ 0 Connect Tests ✓ 0 × 0 coverage: progress
Ln 24, Col 1 Spaces: 4 UTF-8 LF {} JavaScript

```
// src/components/Header.js
import React from 'react';
import { Link } from 'react-router-dom';

function Header() {
  return (
    <header>
      <h1>Programmatic Navigation Demo</h1>
      <nav>
        <ul>
          <li>
            <Link to="/">Home</Link>
          </li>
          <li>
            <Link to="/dashboard">Dashboard</Link>
          </li>
        </ul>
      </nav>
    </header>
```

```
To address all issues (including breaking changes), run:
  npm audit fix --force

Run `npm audit` for details.
labuser@ubuntu2204:~/Documents/my-react-app/programmatic-navigation-demo$
```

Note: Save the file

3.4 Inside the **components** folder, create a new JavaScript file named **Footer.js**


Applications
Footer.js - Documents - ...
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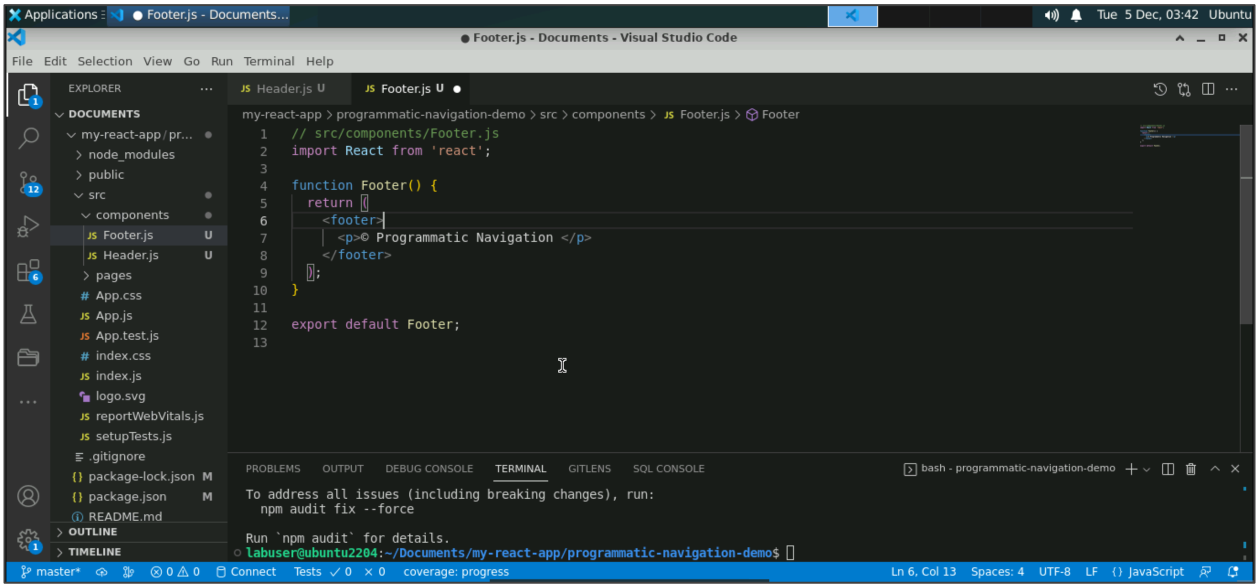
Footer.js - Documents - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
DOCUMENTS
my-react-app / pr...
node_modules
public
src
components
Footer.js U
Header.js U
pages
App.css
App.js
App.test.js
Header.js U
Footer.js U
my-react-app > programmatic-navigation-demo > src > components > Footer.js

3.5 Add the following code to the **Footer.js** file:

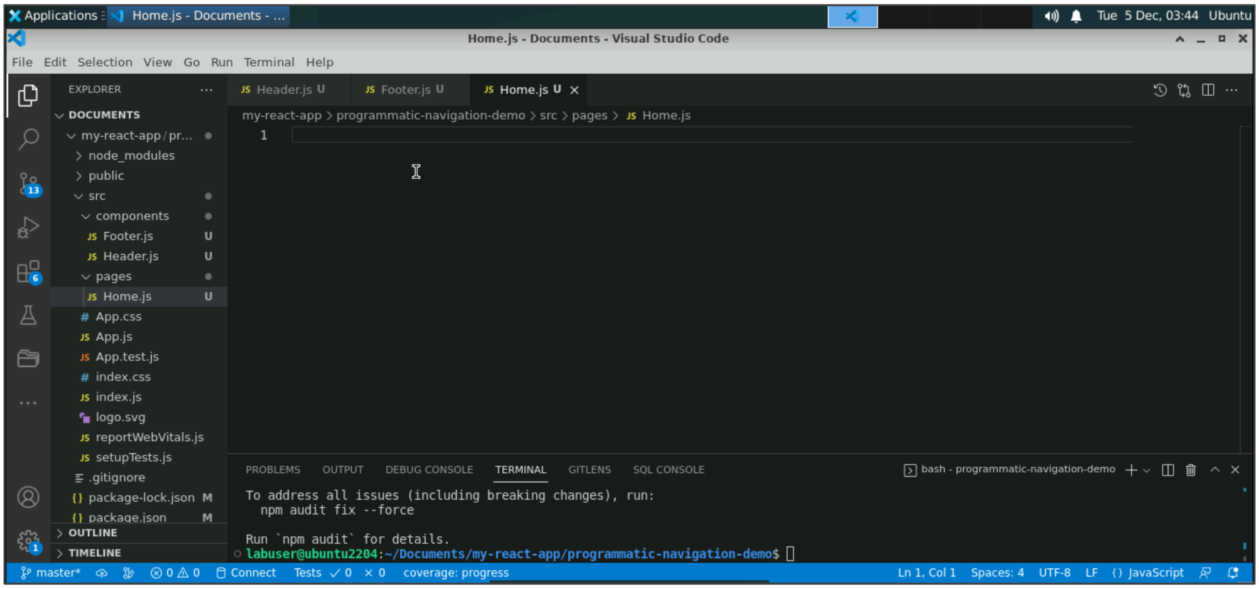
```
// src/components/Footer.js
import React from 'react';

function Footer() {
  return (
    <footer>
      <p>© Programmatic Navigation </p>
    </footer>
  );
}

export default Footer;
```



```
// src/components/Footer.js
import React from 'react';

function Footer() {
  return (
    <footer>
      <p>© Programmatic Navigation </p>
    </footer>
  );
}

export default Footer;
```

```
To address all issues (including breaking changes), run:
  npm audit fix --force

Run `npm audit` for details.
labuser@ubuntu2204:~/Documents/my-react-app/programmatic-navigation-demo$
```

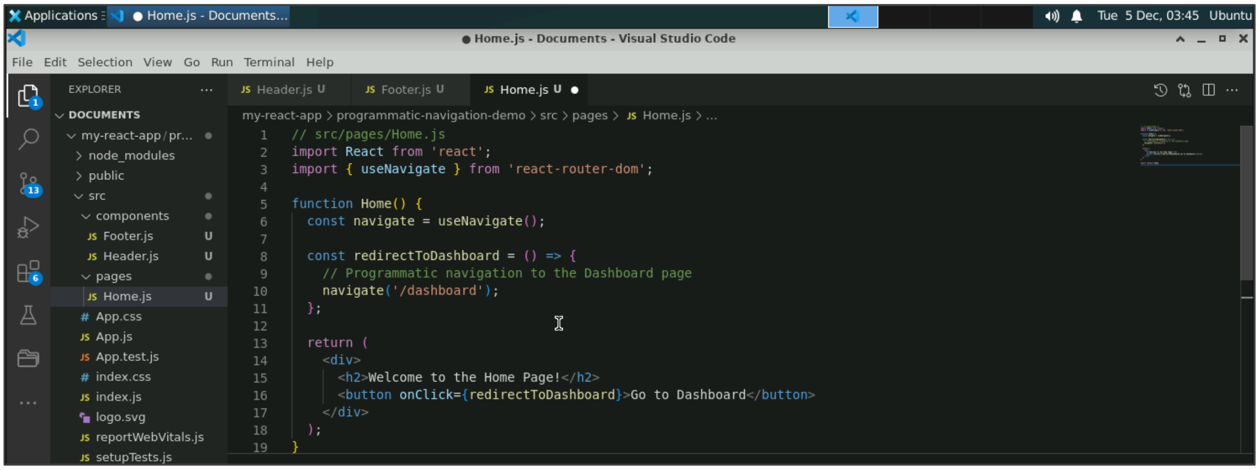
3.6 Inside the **pages** folder, create a new JavaScript file named **Home.js**



```
To address all issues (including breaking changes), run:
  npm audit fix --force

Run `npm audit` for details.
labuser@ubuntu2204:~/Documents/my-react-app/programmatic-navigation-demo$
```

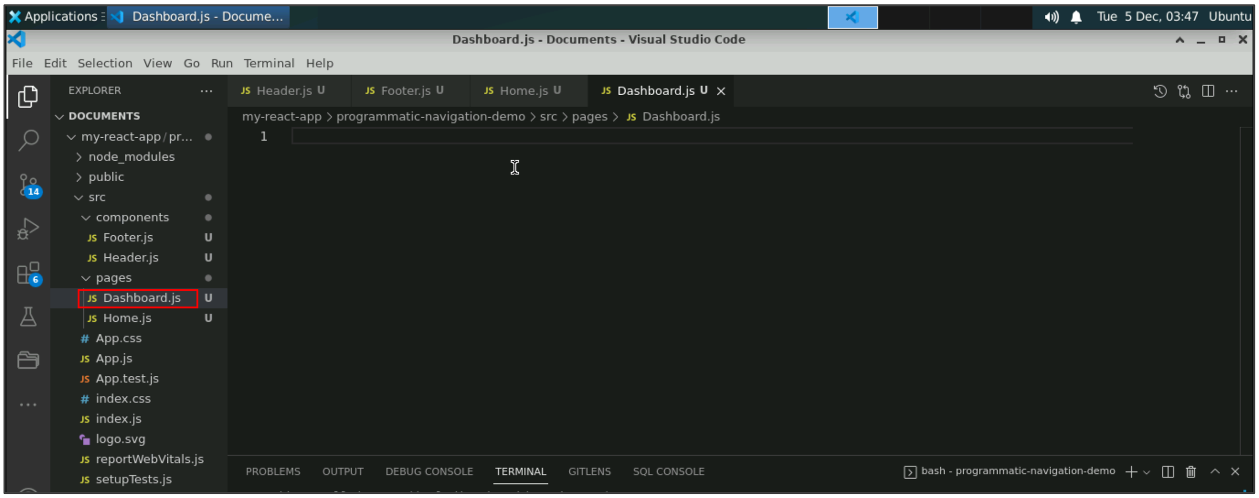
3.7 Add the following code to the **Home.js** file:

```
// src/pages/Home.js
import React from 'react';
import { useNavigate } from 'react-router-dom';

function Home() {
  const navigate = useNavigate();

  const redirectToDashboard = () => {

    // Programmatic navigation to the Dashboard page
    navigate('/dashboard');
  };

  return (
    <div>
      <h2>Welcome to the Home Page!</h2>
      <button onClick={redirectToDashboard}>Go to Dashboard</button>
    </div>
  );
}

export default Home;
```



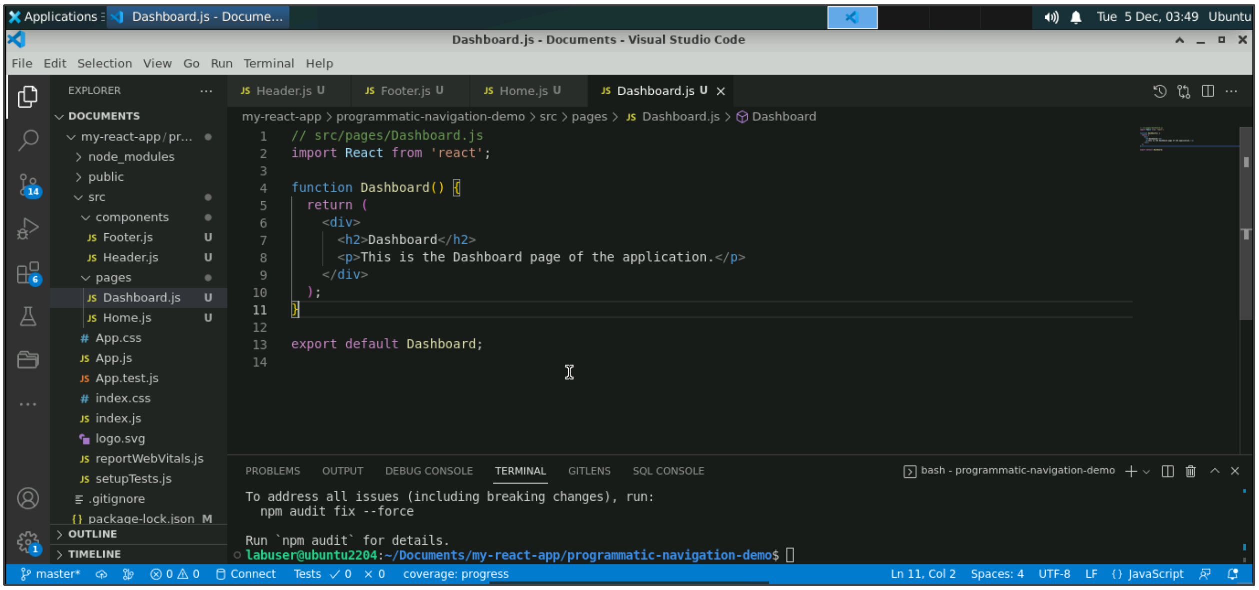
```
// src/pages/Home.js
import React from 'react';
import { useNavigate } from 'react-router-dom';

function Home() {
  const navigate = useNavigate();

  const redirectToDashboard = () => {
    // Programmatic navigation to the Dashboard page
    navigate('/dashboard');
  };

  return (
    <div>
      <h2>Welcome to the Home Page!</h2>
      <button onClick={redirectToDashboard}>Go to Dashboard</button>
    </div>
  );
}
```

3.8 Inside the **pages** folder, create a new JavaScript file named **Dashboard.js**



3.9 Add the following code to the **Dashboard.js** file:

```
// src/pages/Dashboard.js
import React from 'react';

function Dashboard() {
  return (
    <div>
      <h2>Dashboard</h2>
      <p>This is the Dashboard page of the application.</p>
    </div>
  );
}
export default Dashboard;
```



Applications
Dashboard.js - Docume...
Tue 5 Dec, 03:49 Ubuntu
Dashboard.js - Documents - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
DOCUMENTS
my-react-app / pr...
node_modules
public
src
components
Footer.js U
Header.js U
pages
Dashboard.js U
Home.js U
App.css
App.js
App.test.js
index.css
index.js
logo.svg
reportWebVitals.js
setupTests.js
.gitignore
package-lock.json M
OUTLINE
TIMELINE
Header.js U
Footer.js U
Home.js U
Dashboard.js U
my-react-app > programmatic-navigation-demo > src > pages > Dashboard.js > Dashboard
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL GITLENS SQL CONSOLE
bash - programmatic-navigation-demo
master* ⊗ 0 ⚠ 0 Connect Tests ✓ 0 ✕ 0 coverage: progress
Ln 11, Col 2 Spaces: 4 UTF-8 LF {} JavaScript

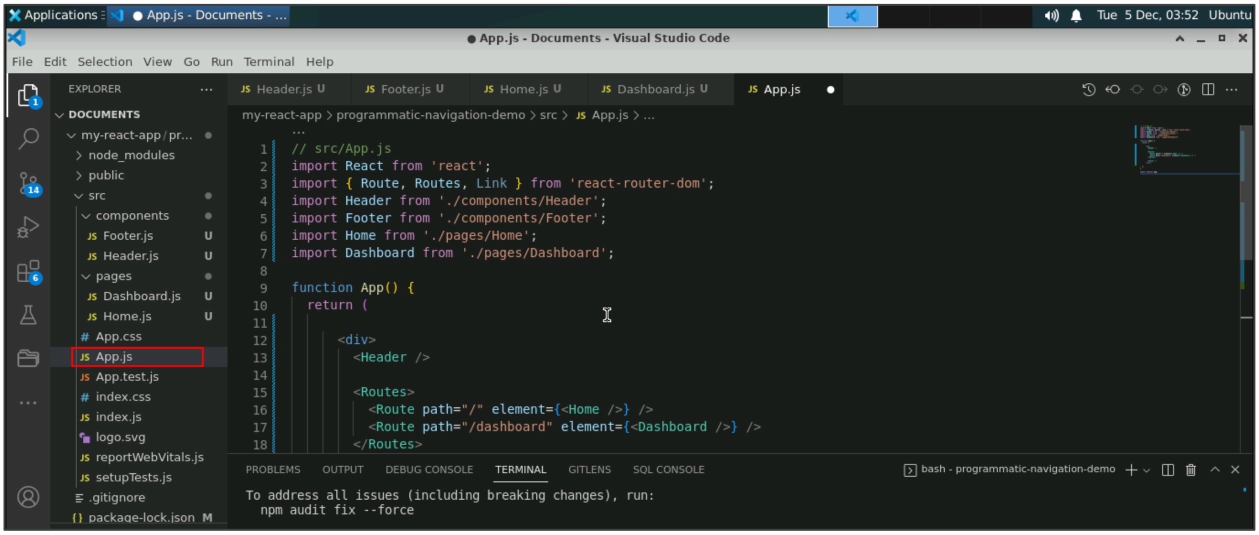
```
// src/pages/Dashboard.js
import React from 'react';

function Dashboard() {
  return (
    <div>
      <h2>Dashboard</h2>
      <p>This is the Dashboard page of the application.</p>
    </div>
  );
}

export default Dashboard;
```

```
To address all issues (including breaking changes), run:
  npm audit fix --force

Run `npm audit` for details.
labuser@ubuntu2204:~/Documents/my-react-app/programmatic-navigation-demo$ 
```

Step 4: Create programmatic navigation

4.1 Replace the existing code in the **App.js** file with the following code:

```
// src/App.js
import React from 'react';
import { Route, Routes, Link } from 'react-router-dom';
import Header from './components/Header';
import Footer from './components/Footer';
import Home from './pages/Home';
import Dashboard from './pages/Dashboard';


function App() {
  return (

    <div>
      <Header />

      <Routes>
        <Route path="/" element={<Home />} />
        <Route path="/dashboard" element={<Dashboard />} />
      </Routes>

      <Footer />
    </div>
  );
}

export default App;
```

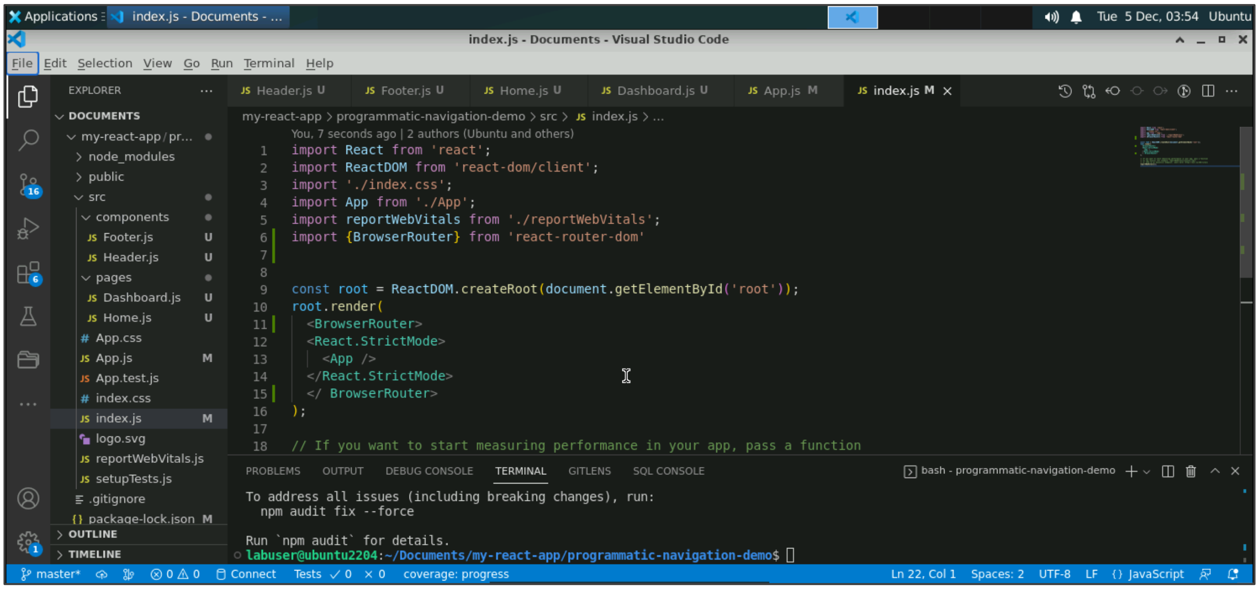


```
// src/App.js
import React from 'react';
import { Route, Routes, Link } from 'react-router-dom';
import Header from './components/Header';
import Footer from './components/Footer';
import Home from './pages/Home';
import Dashboard from './pages/Dashboard';

function App() {
  return (

      <div>
        <Header />

        <Routes>
          <Route path="/" element={<Home />} />
          <Route path="/dashboard" element={<Dashboard />} />
        </Routes>
```

```
To address all issues (including breaking changes), run:
  npm audit fix --force
```

4.2 Replace the existing code in the **index.js** file with the following code:

```
import React from 'react';
import ReactDOM from 'react-dom/client';
import './index.css';
import App from './App';
import reportWebVitals from './reportWebVitals';
import {BrowserRouter} from 'react-router-dom'

const root = ReactDOM.createRoot(document.getElementById('root'));
root.render(

  <BrowserRouter>
  <React.StrictMode>
    <App />
  </React.StrictMode>
  </ BrowserRouter>
);

// If you want to start measuring performance in your app, pass a function
// to log results (for example: reportWebVitals(console.log))
// or send to an analytics endpoint. Learn more: https://bit.ly/CRA-vitals
reportWebVitals();
```



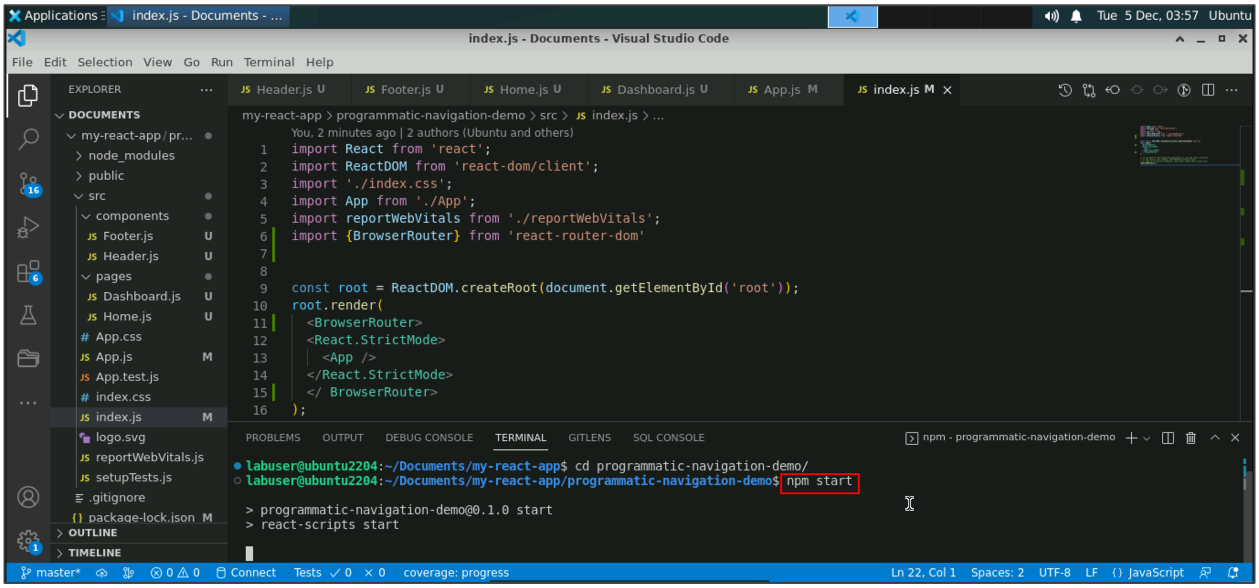
```
import React from 'react';
import ReactDOM from 'react-dom/client';
import './index.css';
import App from './App';
import reportWebVitals from './reportWebVitals';
import {BrowserRouter} from 'react-router-dom'

const root = ReactDOM.createRoot(document.getElementById('root'));
root.render(
  <BrowserRouter>
  <React.StrictMode>
    <App />
  </React.StrictMode>
  </ BrowserRouter>
);

// If you want to start measuring performance in your app, pass a function
```

```
To address all issues (including breaking changes), run:
  npm audit fix --force

Run `npm audit` for details.
labuser@ubuntu2204:~/Documents/my-react-app/programmatic-navigation-demo$
```

Note: Save all the files

Step 5: Run the application

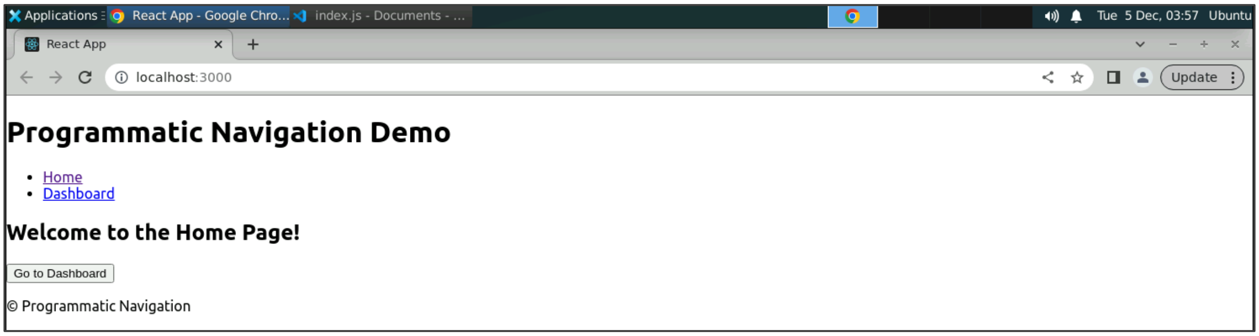
5.1 Start the React development server using the following command:
npm start



index.js - Documents - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
DOCUMENTS
You, 2 minutes ago | 2 authors (Ubuntu and others)
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
GITLENS
SQL CONSOLE
npm - programmatic-navigation-demo
Ln 22, Col 1

```
import React from 'react';
import ReactDOM from 'react-dom/client';
import './index.css';
import App from './App';
import reportWebVitals from './reportWebVitals';
import {BrowserRouter} from 'react-router-dom'

const root = ReactDOM.createRoot(document.getElementById('root'));
root.render(
  <BrowserRouter>
  <React.StrictMode>
    <App />
  </React.StrictMode>
  </ BrowserRouter>
);
```

```
labuser@ubuntu2204:~/Documents/my-react-app$ cd programmatic-navigation-demo/
labuser@ubuntu2204:~/Documents/my-react-app/programmatic-navigation-demo$ npm start

> programmatic-navigation-demo@0.1.0 start
> react-scripts start
```



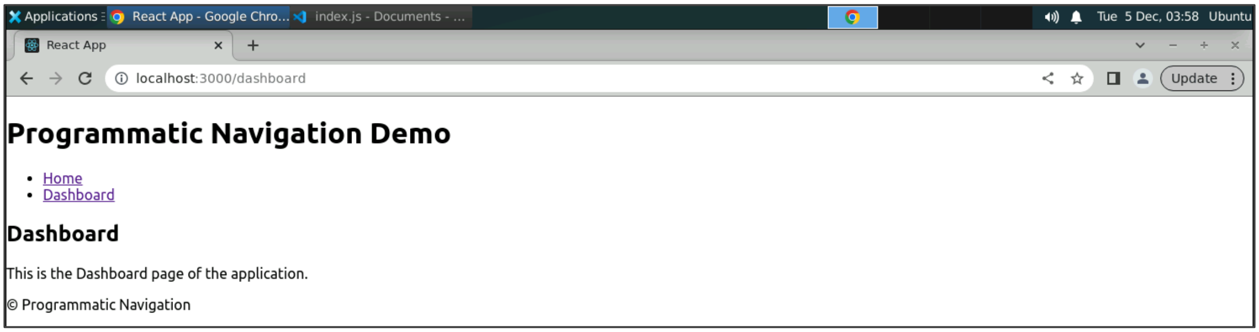
Programmatic Navigation Demo

- Home
- Dashboard

Welcome to the Home Page!

Go to Dashboard

© Programmatic Navigation



Programmatic Navigation Demo

- Home
- Dashboard

Dashboard

This is the Dashboard page of the application.

© Programmatic Navigation

By following these steps, you have successfully demonstrated programmatic navigation in your React application to enhance user interaction and navigation experience.