Lesson 05 Demo 04

Creating a React Application Demonstrating Retrieval of Data

Objective: To develop a React application that demonstrates retrieval of data asynchronously

Tools required: Node Terminal, React app, and Visual Studio Code

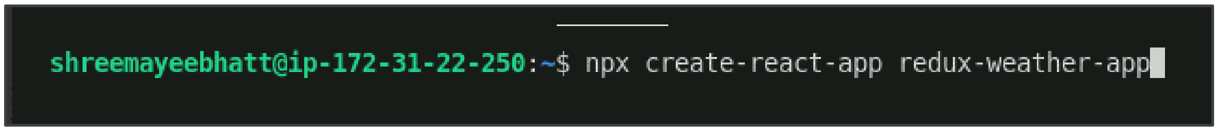
Prerequisites: Knowledge of creating a React app and understanding of the folder structure

Steps to be followed:

1. Create a new React app
2. Create a new file called reducers.js
3. Create a new file called types.js
4. Create a new file called actions.js
5. Create a new file called Weather.js
6. Create a new file called WeatherForm.js
7. Open the existing file App.js in the src folder
8. Create a new file called index.js
9. Create a new file called .env
10. Update the axios.get URL in actions.js
11. Run the app and view it in the browser

Step 1: Create a new React app

1.1 Open your terminal and run the **npx create-react-app redux-weather-app** command

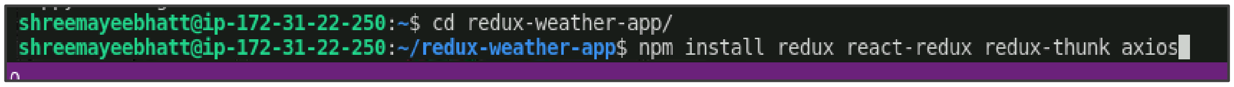


```
shreemayeebhatt@ip-172-31-22-250:~$ npx create-react-app redux-weather-app
```

Note: this command will create a new React app with the name redux-weather-app

1.2 Move to the **redux-weather-app** directory by running the **cd redux-weather-app** command in the terminal

1.3 Install the necessary dependencies by running the command **npm install redux react-redux redux-thunk axios**



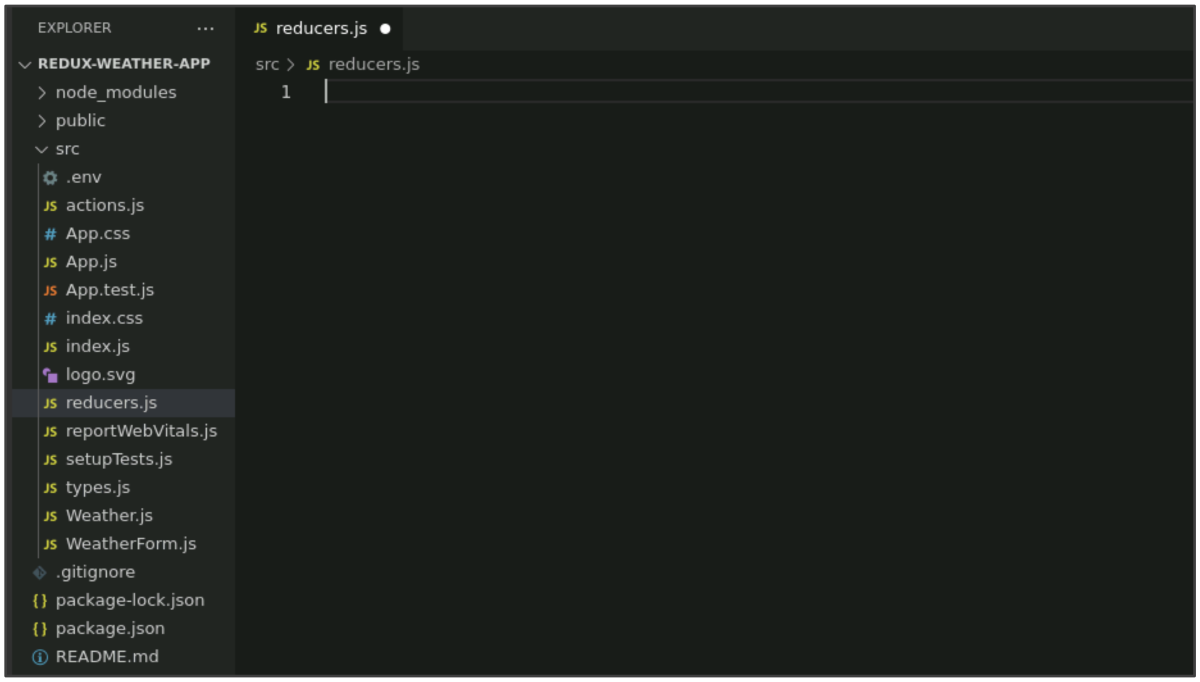
```
shreemayeebhatt@ip-172-31-22-250:~$ cd redux-weather-app/
shreemayeebhatt@ip-172-31-22-250:~/redux-weather-app$ npm install redux react-redux redux-thunk axios
```

Step 2: Create a new file called reducers.js

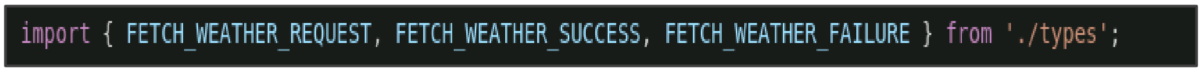
2.1 Open **Visual Studio Code**

2.2 Navigate to the project folder

2.3 In the **src** directory, create a new file named **reducers.js**

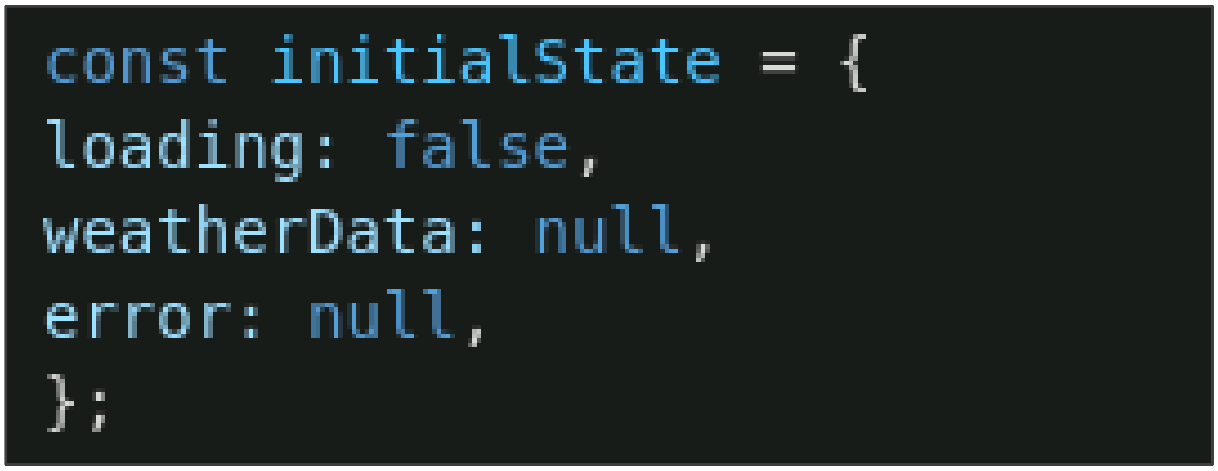


2.4 Import the necessary action types from **./types**



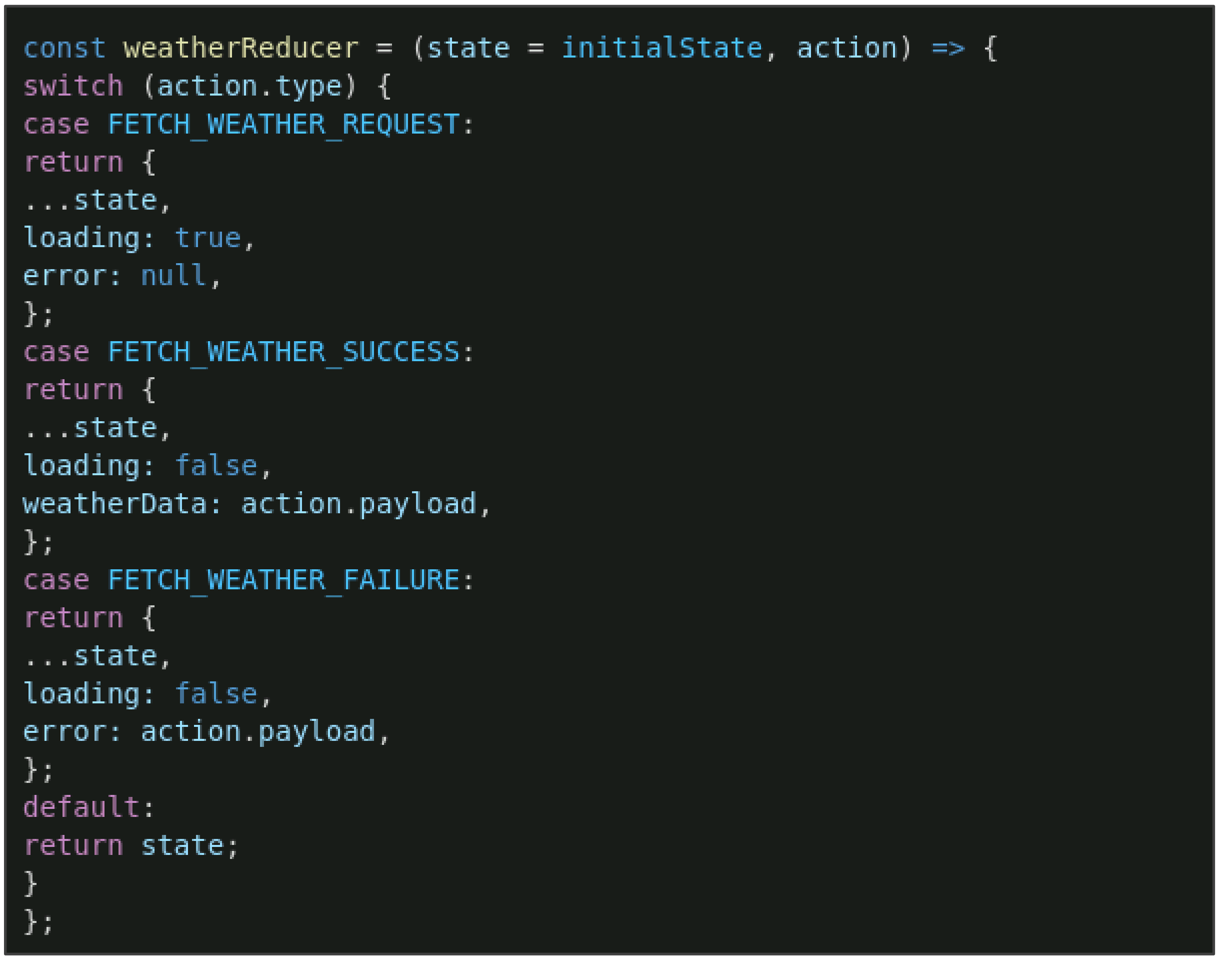
```
import { FETCH_WEATHER_REQUEST, FETCH_WEATHER_SUCCESS, FETCH_WEATHER_FAILURE } from './types';
```

2.5 Define the **initial state** for the weather data



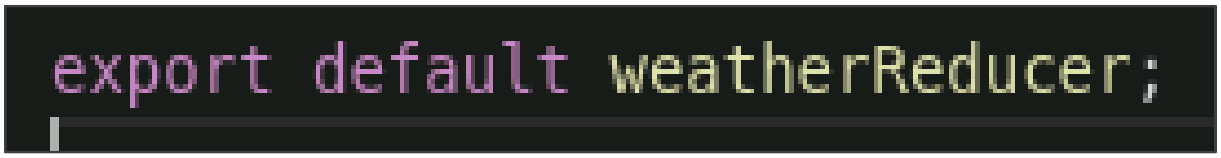
```
const initialState = {
loading: false,
weatherData: null,
error: null,
};
```

2.6 Create the weather **reducer** function that handles the state updates based on the **dispatched** actions



```
const weatherReducer = (state = initialState, action) => {
switch (action.type) {
case FETCH_WEATHER_REQUEST:
return {
...state,
loading: true,
error: null,
};
case FETCH_WEATHER_SUCCESS:
return {
...state,
loading: false,
weatherData: action.payload,
};
case FETCH_WEATHER_FAILURE:
return {
...state,
loading: false,
error: action.payload,
};
default:
return state;
}
};
```

2.7 Export the **weatherReducer**

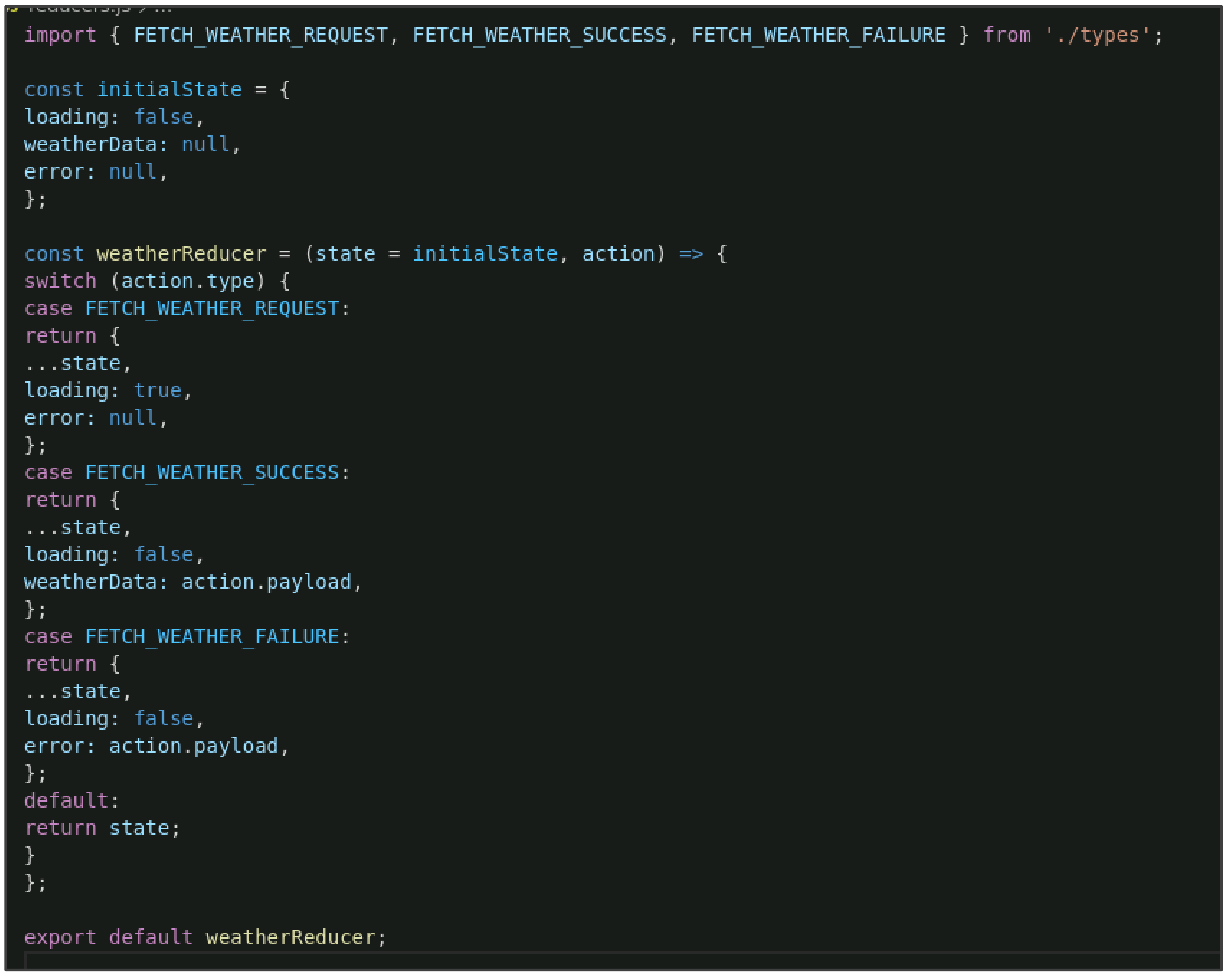


```
export default weatherReducer;
```

```
import { FETCH_WEATHER_REQUEST, FETCH_WEATHER_SUCCESS,
FETCH_WEATHER_FAILURE } from './types';
const initialState = {
loading: false,
weatherData: null,
error: null,

};
const weatherReducer = (state = initialState, action) => {
switch (action.type) {
case FETCH_WEATHER_REQUEST:
return {
...state,
loading: true,
error: null,
};
case FETCH_WEATHER_SUCCESS:
return {
...state,
loading: false,
weatherData: action.payload,
};
case FETCH_WEATHER_FAILURE:
return {
...state,
loading: false,
error: action.payload,
};
default:
return state;
}
```

};

export default weatherReducer;

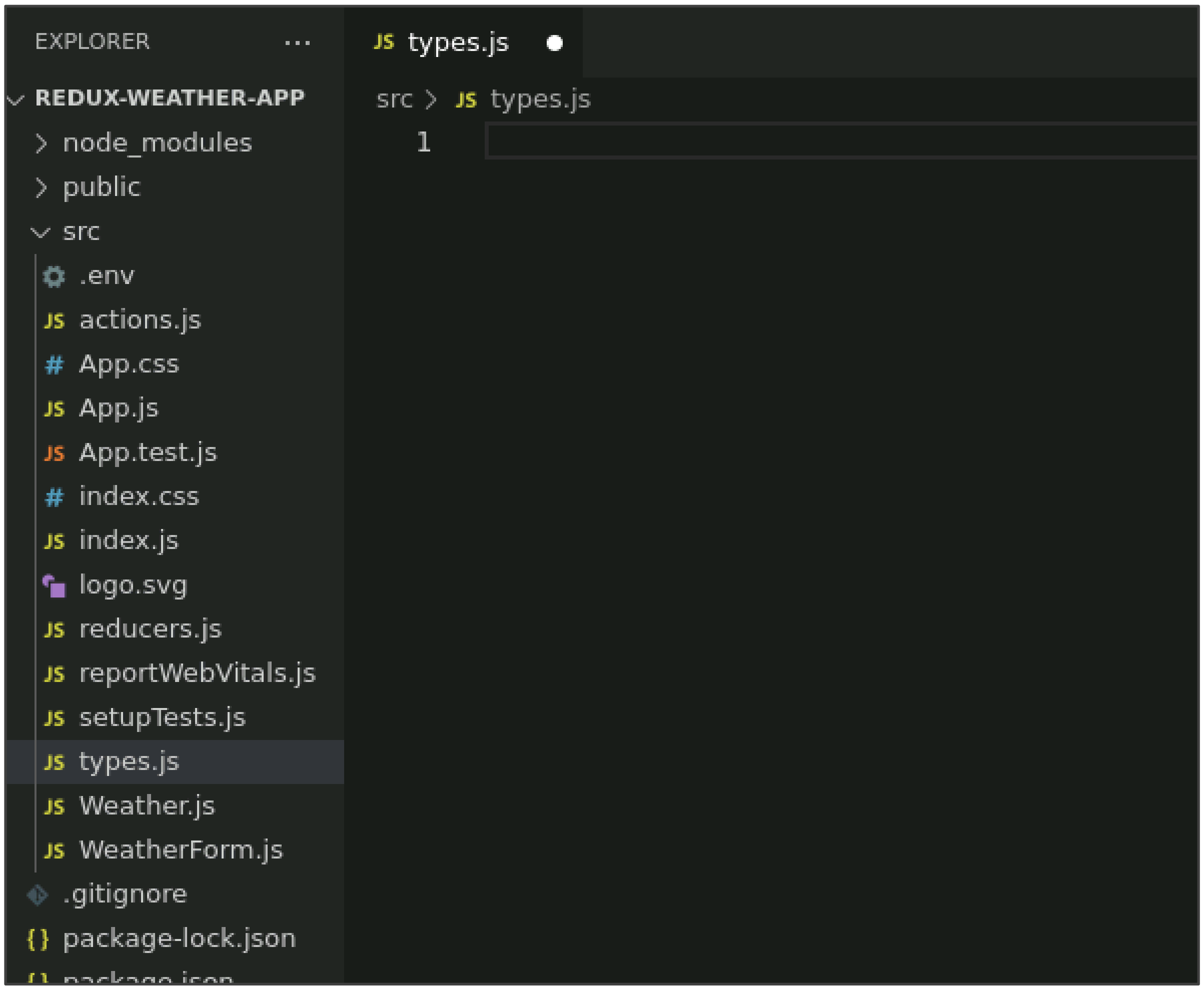


```
import { FETCH_WEATHER_REQUEST, FETCH_WEATHER_SUCCESS, FETCH_WEATHER_FAILURE } from './types';

const initialState = {
loading: false,
weatherData: null,
error: null,
};

const weatherReducer = (state = initialState, action) => {
switch (action.type) {
case FETCH_WEATHER_REQUEST:
return {
...state,
loading: true,
error: null,
};
case FETCH_WEATHER_SUCCESS:
return {
...state,
loading: false,
weatherData: action.payload,
};
case FETCH_WEATHER_FAILURE:
return {
...state,
loading: false,
error: action.payload,
};
default:
return state;
}
};

export default weatherReducer;
```

This will contain the **reducer** function that will manage the state of the weather data

Step 3: Create a new file called types.js

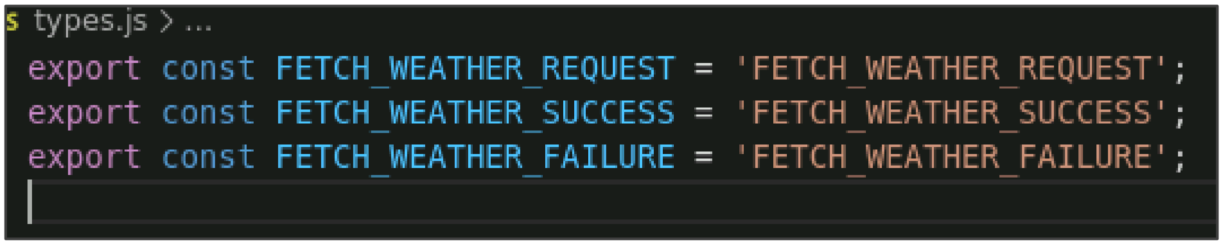
3.1 In the **src** directory, create a new file named **types.js**



```
EXPLORER ...
REDUX-WEATHER-APP
  > node_modules
  > public
  v src
     .env
     actions.js
     App.css
     App.js
     App.test.js
     index.css
     index.js
     logo.svg
     reducers.js
     reportWebVitals.js
     setupTests.js
     types.js
     Weather.js
     WeatherForm.js
  .gitignore
  package-lock.json
```

```
types.js ●
src > types.js
```

3.2 Define the action types as constants that will be used in the **reducer** and **actions**

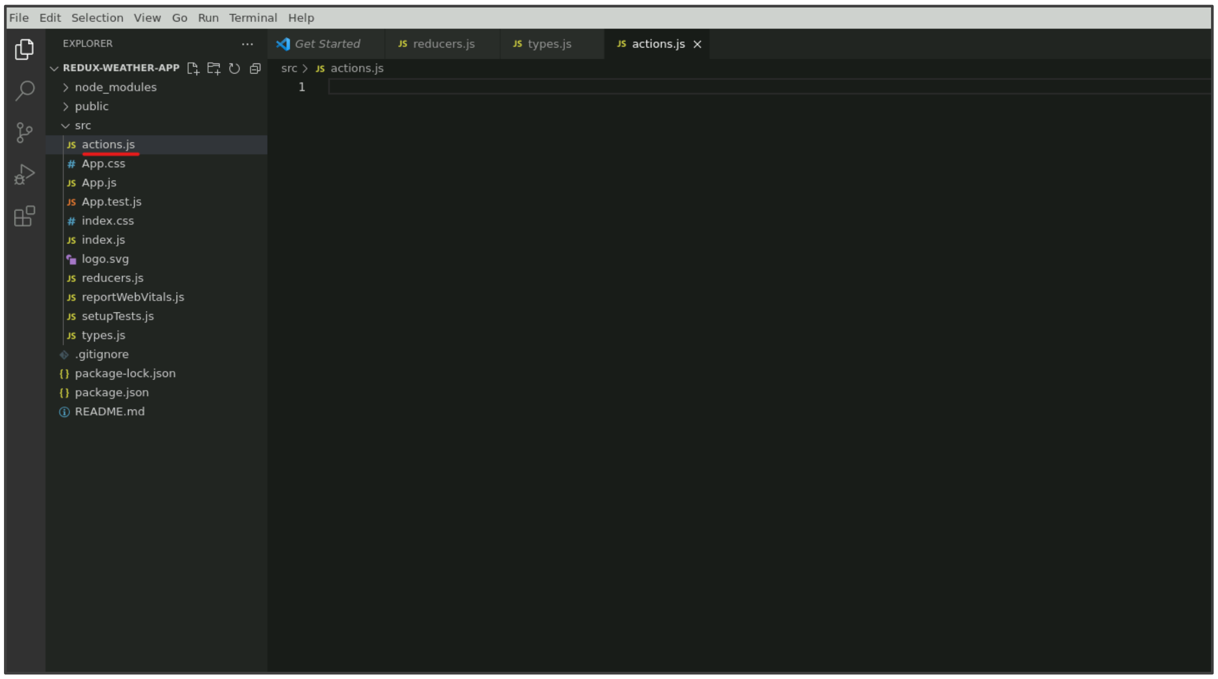


```
types.js > ...
export const FETCH_WEATHER_REQUEST = 'FETCH_WEATHER_REQUEST';
export const FETCH_WEATHER_SUCCESS = 'FETCH_WEATHER_SUCCESS';
export const FETCH_WEATHER_FAILURE = 'FETCH_WEATHER_FAILURE';
```

This will contain the action types that we will use in our **reducer**

Step 4: Create a new file called actions.js

4.1 In the **src** directory, create a new file named **actions.js**



4.2 Import **Axios** for making HTTP requests, the action types from **./types**, and the necessary dependencies for **async** actions

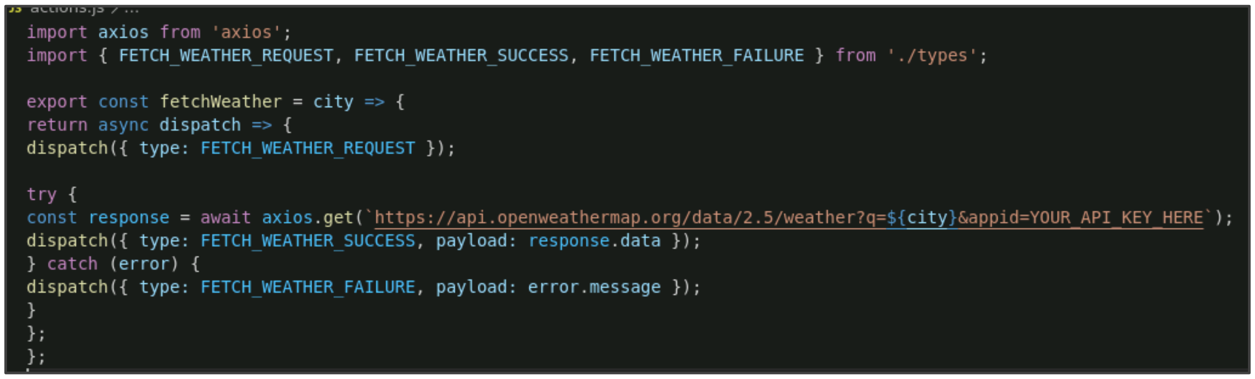
```
import axios from 'axios';
import { FETCH_WEATHER_REQUEST, FETCH_WEATHER_SUCCESS, FETCH_WEATHER_FAILURE } from './types';
```

4.3 Define the **fetchWeather** action creator that makes an asynchronous **API** call to fetch weather data based on the city

4.4 Dispatch the corresponding actions based on the success or failure of the **API** request

```
export const fetchWeather = city => {
return async dispatch => {
dispatch({ type: FETCH_WEATHER_REQUEST });

try {
const response = await axios.get(`https://api.openweathermap.org/data/2.5/weather?q=${city}&appid=YOUR_API_KEY_HERE`);
dispatch({ type: FETCH_WEATHER_SUCCESS, payload: response.data });
} catch (error) {
dispatch({ type: FETCH_WEATHER_FAILURE, payload: error.message });
}
};
};
```

```
import axios from 'axios';

import { FETCH_WEATHER_REQUEST, FETCH_WEATHER_SUCCESS,
FETCH_WEATHER_FAILURE } from './types';
export const fetchWeather = city => {
return async dispatch => {

dispatch({ type: FETCH_WEATHER_REQUEST });
try {
const response = await
axios.get(`https://api.openweathermap.org/data/2.5/weather?q=${city}&
appid=YOUR_API_KEY_HERE`);
dispatch({ type: FETCH_WEATHER_SUCCESS, payload: response.data });
} catch (error) {
dispatch({ type: FETCH_WEATHER_FAILURE, payload: error.message });
}

};
};
```



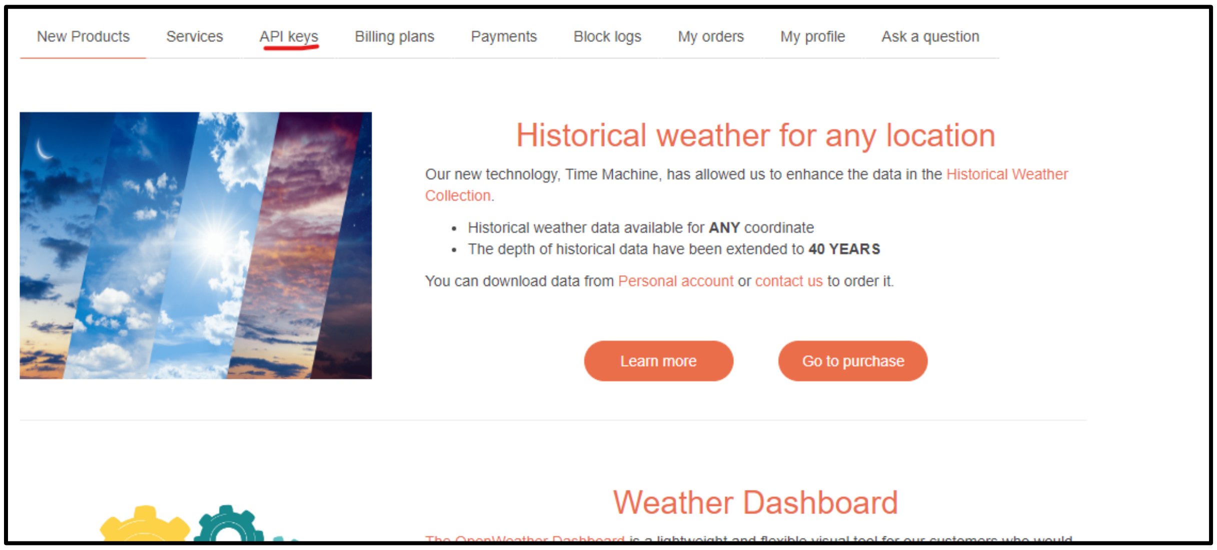
```
import axios from 'axios';
import { FETCH_WEATHER_REQUEST, FETCH_WEATHER_SUCCESS, FETCH_WEATHER_FAILURE } from './types';

export const fetchWeather = city => {
return async dispatch => {
dispatch({ type: FETCH_WEATHER_REQUEST });

try {
const response = await axios.get(`https://api.openweathermap.org/data/2.5/weather?q=${city}&appid=YOUR_API_KEY_HERE`);
dispatch({ type: FETCH_WEATHER_SUCCESS, payload: response.data });
} catch (error) {
dispatch({ type: FETCH_WEATHER_FAILURE, payload: error.message });
}
};
};
```

Note:

To get the **API** Key:

1. Go to **https://api.openweathermap.org** and sign up

2. Go to **API** keys on the home page



Historical weather for any location

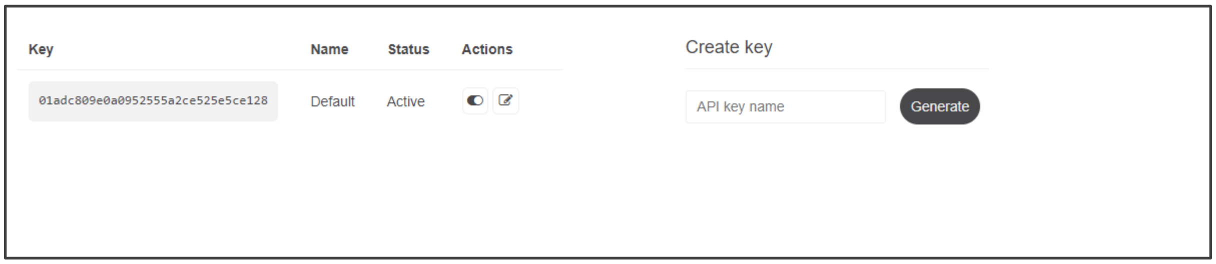
Our new technology, Time Machine, has allowed us to enhance the data in the Historical Weather Collection.

- Historical weather data available for **ANY** coordinate
- The depth of historical data have been extended to **40 YEARS**

You can download data from Personal account or contact us to order it.

Weather Dashboard

3. Copy the key and paste it in a code

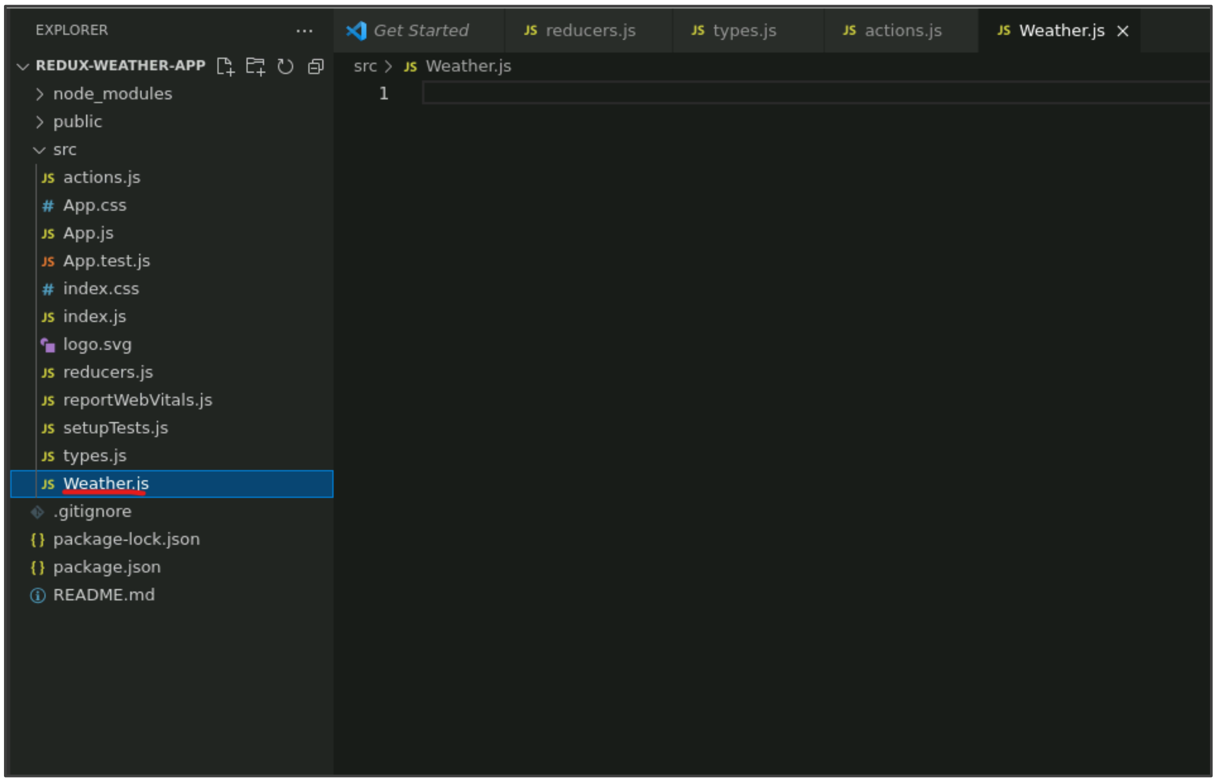


Key	Name	Status	Actions
01adc809e0a0952555a2ce525e5ce128	Default	Active	

This will contain the action creators that will dispatch the actions to the reducer.

Step 5: Create a new file called Weather.js

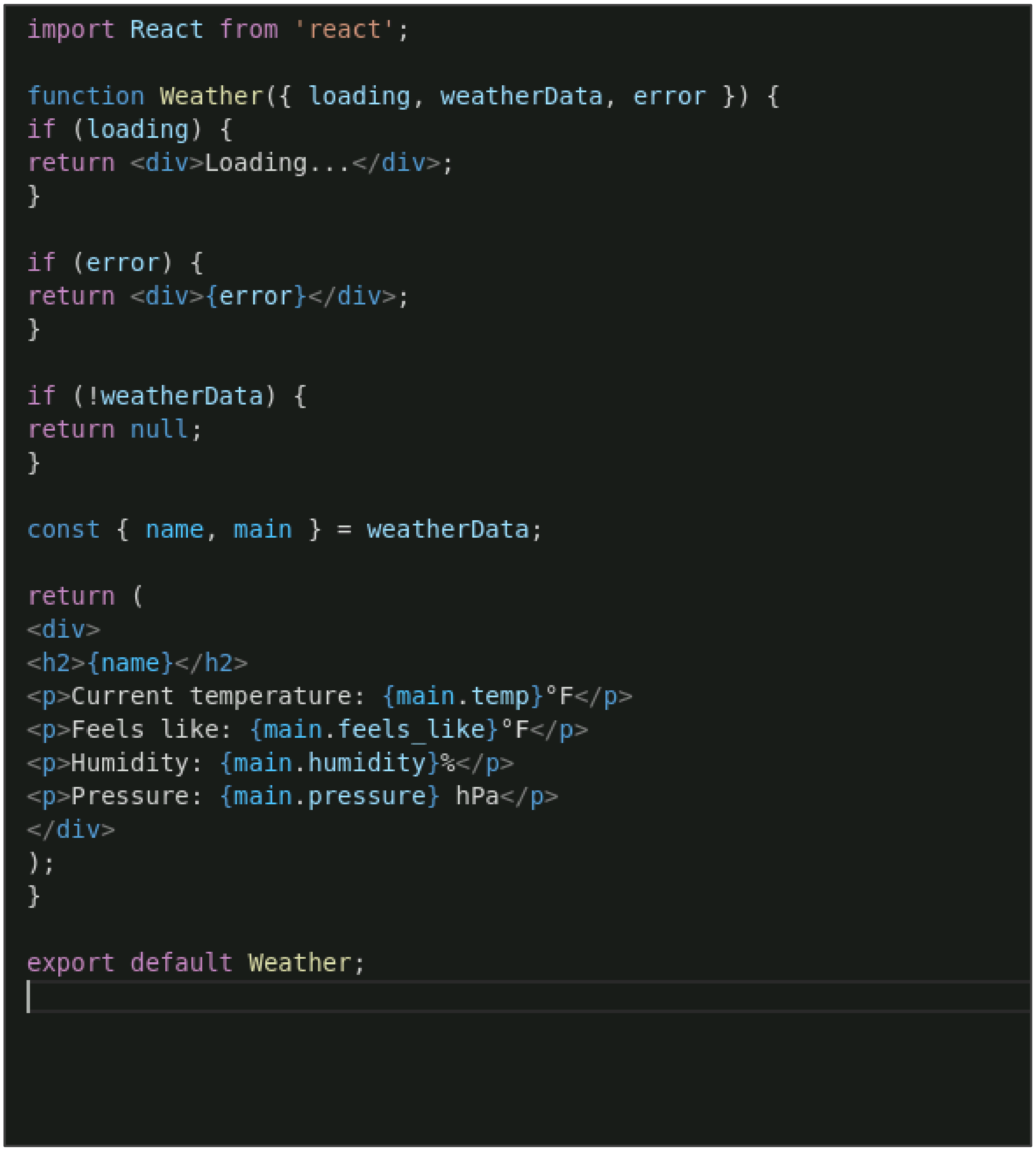
5.1 In the **src** directory, create a new file called **Weather.js**



5.2 Create the functional component **Weather** that receives the loading, **weatherData**, and **error props**

5.3 Render different elements based on the loading and error states, displaying the weather data if available

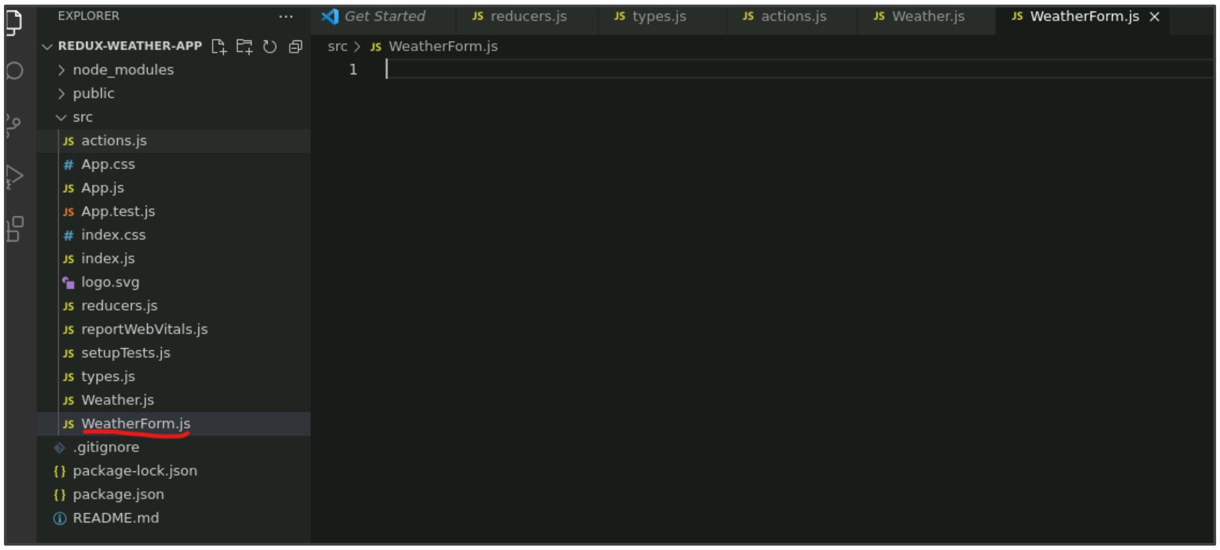
```
import React from 'react';
function Weather({ loading, weatherData, error }) {
if (loading) {
return <div>Loading...</div>;
}

if (error) {
return <div>{error}</div>;
}

if (!weatherData) {
return null;
}

const { name, main } = weatherData;

return (
<div>
<h2>{name}</h2>
<p>Current temperature: {main.temp}°F</p>
<p>Feels like: {main.feels_like}°F</p>
<p>Humidity: {main.humidity}%</p>
<p>Pressure: {main.pressure} hPa</p>
</div>
);
}

export default Weather;
```



```
import React from 'react';

function Weather({ loading, weatherData, error }) {
if (loading) {
return <div>Loading...</div>;
}

if (error) {
return <div>{error}</div>;
}

if (!weatherData) {
return null;
}

const { name, main } = weatherData;

return (
<div>
<h2>{name}</h2>
<p>Current temperature: {main.temp}°F</p>
<p>Feels like: {main.feels_like}°F</p>
<p>Humidity: {main.humidity}%</p>
<p>Pressure: {main.pressure} hPa</p>
</div>
);
}

export default Weather;
```

Step 6: Create a new file called WeatherForm.js

6.1 In the **src** directory, create a new file named **WeatherForm.js**



6.2 Create the functional component **WeatherForm** that receives the **onSubmit** props

6.3 Use the **useState** hook to manage the input value for the city

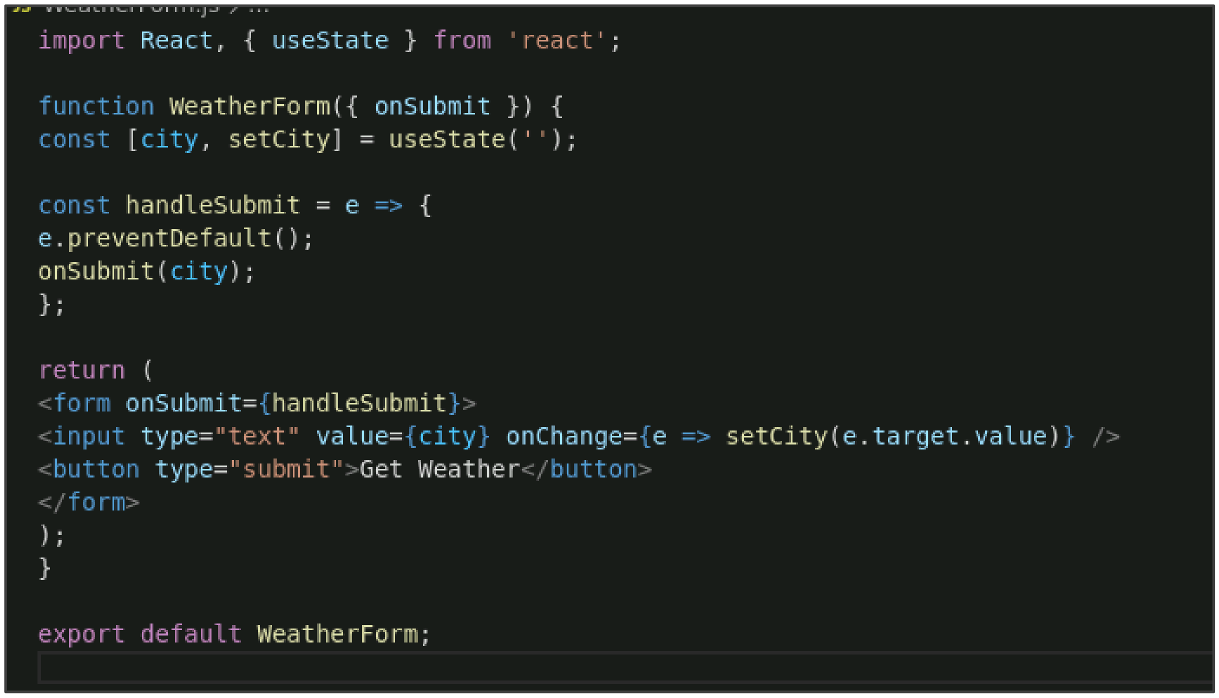
6.4 Handle form submission by calling the **onSubmit** function with the city value

```
import React, { useState } from 'react';
function WeatherForm({ onSubmit })
{
const [city, setCity] = useState('');
const handleSubmit = e => {
e.preventDefault();
onSubmit(city);
};
return (

<form onSubmit={handleSubmit}>
<input type="text" value={city} onChange={e => setCity(e.target.value)} />
<button type="submit">Get Weather</button>

</form>
```

);

}

export default WeatherForm;



```
import React, { useState } from 'react';

function WeatherForm({ onSubmit }) {
const [city, setCity] = useState('');

const handleSubmit = e => {
e.preventDefault();
onSubmit(city);
};

return (
<form onSubmit={handleSubmit}>
<input type="text" value={city} onChange={e => setCity(e.target.value)} />
<button type="submit">Get Weather</button>
</form>
);
}

export default WeatherForm;
```

This will be our presentational component that will display the form to enter a city and submit it to fetch the weather data

Step 7: Open the existing file App.js in the src folder

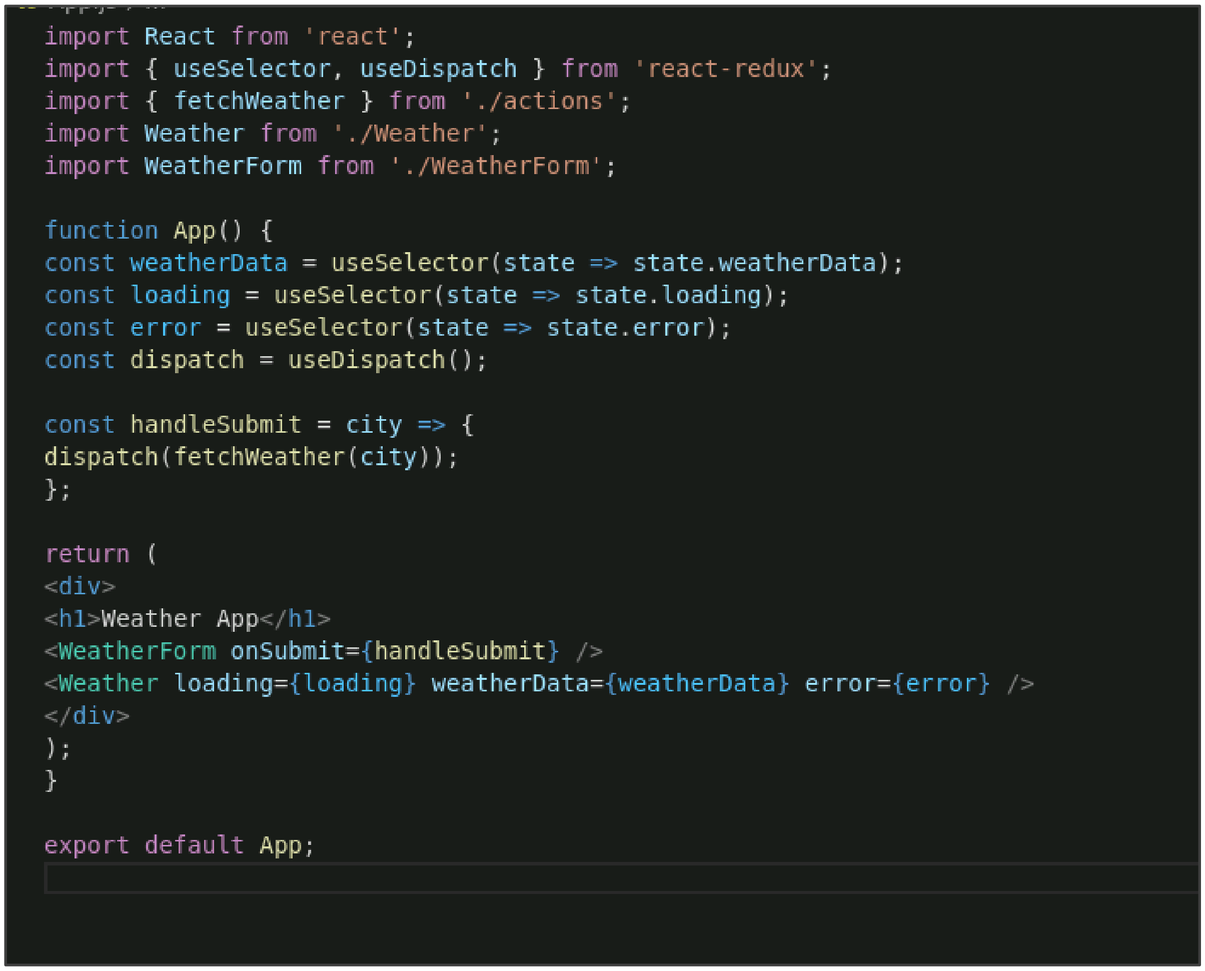
7.1 In the **src** directory, create a new file named **App.js**

7.2 Import the necessary dependencies, including the **Weather**, **WeatherForm components**, and the **fetchWeather action creator**

7.3 Create the app's functional component that makes use of the **useSelector** and **useDispatch** hooks to access the Redux store's and actions' dispatch mechanisms

7.4 Render the **WeatherForm** and **Weather** components, passing the necessary props

```
import React from 'react';
import { useSelector, useDispatch } from 'react-redux';
import { fetchWeather } from './actions';
import Weather from './Weather';
import WeatherForm from './WeatherForm';

function App() {

const weatherData = useSelector(state => state.weatherData);
const loading = useSelector(state => state.loading);
const error = useSelector(state => state.error);
const dispatch = useDispatch();
const handleSubmit = city => {
dispatch(fetchWeather(city));
};

return (
<div>
<h1>Weather App</h1>


<WeatherForm onSubmit={handleSubmit} />
<Weather loading={loading} weatherData={weatherData} error={error} />
</div>
);
}
export default App;
```



```
import React from 'react';
import { useSelector, useDispatch } from 'react-redux';
import { fetchWeather } from './actions';
import Weather from './Weather';
import WeatherForm from './WeatherForm';

function App() {
const weatherData = useSelector(state => state.weatherData);
const loading = useSelector(state => state.loading);
const error = useSelector(state => state.error);
const dispatch = useDispatch();

const handleSubmit = city => {
dispatch(fetchWeather(city));
};

return (
<div>
<h1>Weather App</h1>
<WeatherForm onSubmit={handleSubmit} />
<Weather loading={loading} weatherData={weatherData} error={error} />
</div>
);
}

export default App;
```

Step 8: Create a new file called index.js

8.1 In the **src** directory, open the **index.js** file

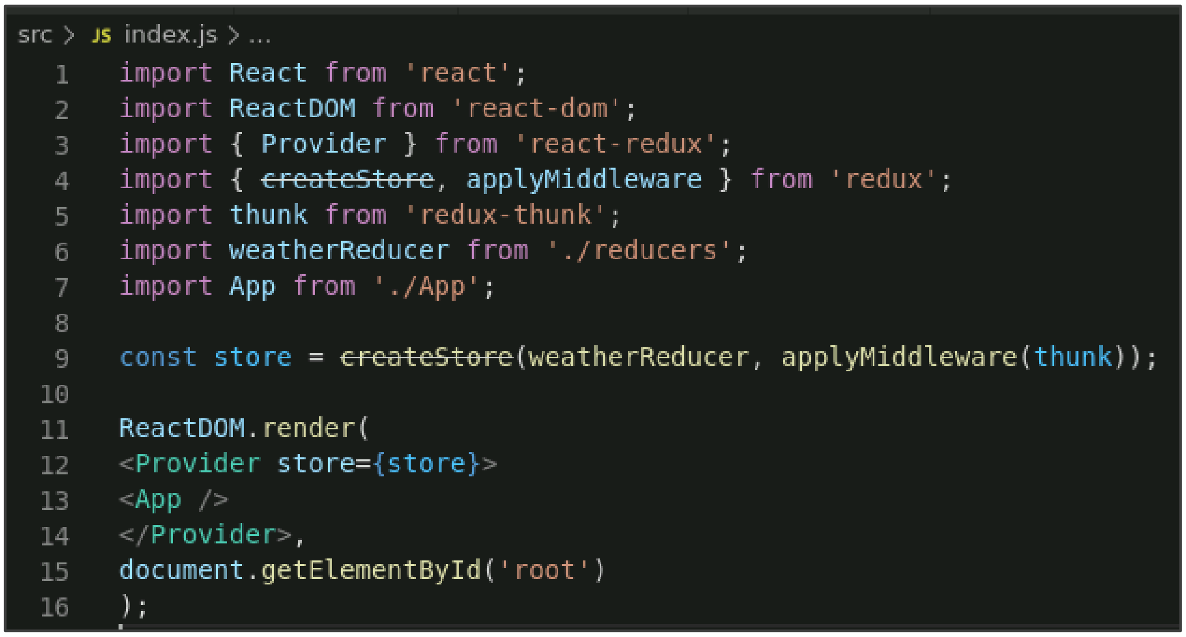
8.2 Import the necessary dependencies, including the **Provider** component**,** the **createStore**, **applyMiddleware** functions, and the **App** component

8.3 Create the Redux store using the **createStore** function, passing the **weatherReducer** and **applyMiddleware(thunk)** as arguments

8.4 Wrap the **App** component with the **Provider** component, passing the Redux store as a props

8.5 Use the **ReactDOM.render** function to render the wrapped App component to the root element in the HTML document

```
import React from 'react';

import ReactDOM from 'react-dom';
import { Provider } from 'react-redux';
import { createStore, applyMiddleware } from 'redux';
import thunk from 'redux-thunk';
import weatherReducer from './reducers';
import App from './App';
const store = createStore(weatherReducer, applyMiddleware(thunk));
ReactDOM.render(
<Provider store={store}>
    <App />
</Provider>,
document.getElementById('root')
);
```



src > JS index.js > ...

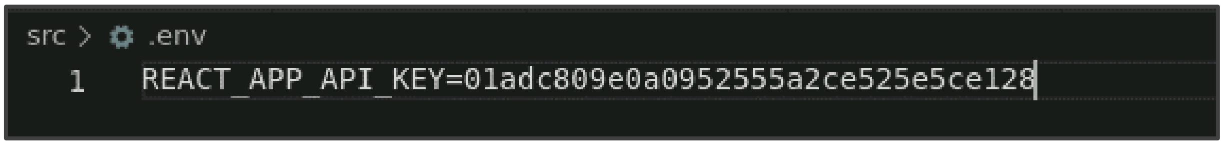
```
import React from 'react';
import ReactDOM from 'react-dom';
import { Provider } from 'react-redux';
import { ~~createStore~~, applyMiddleware } from 'redux';
import thunk from 'redux-thunk';
import weatherReducer from './reducers';
import App from './App';

const store = ~~createStore~~(weatherReducer, applyMiddleware(thunk));

ReactDOM.render(
<Provider store={store}>
<App />
</Provider>,
document.getElementById('root')
);
```

This will be the entry point of our application

Step 9: Create a new file called .env

9.1 In the **src** directory, create a new file named **.env**

9.2 Set the API key from the **OpenWeatherMap** API as an environment variable in the **.env file** - **REACT_APP_API_KEY=YOUR_API_KEY_HERE**

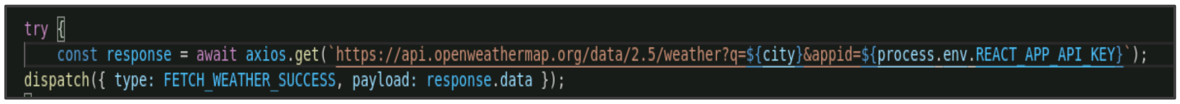


```
src > .env
1    REACT_APP_API_KEY=01adc809e0a0952555a2ce525e5ce128
```

Step 10: Update the axios.get URL in actions.js

10.1 In the **actions.js** file, update the axios.get URL to include the API key from the **.env** file

const response = await axios.get(`https://api.openweathermap.org/data/2.5/weather?q=${city}&appid=${process.env.REACT_APP_API_KEY}`);



```
try {
    const response = await axios.get(`https://api.openweathermap.org/data/2.5/weather?q=${city}&appid=${process.env.REACT_APP_API_KEY}`);
dispatch({ type: FETCH_WEATHER_SUCCESS, payload: response.data });
```

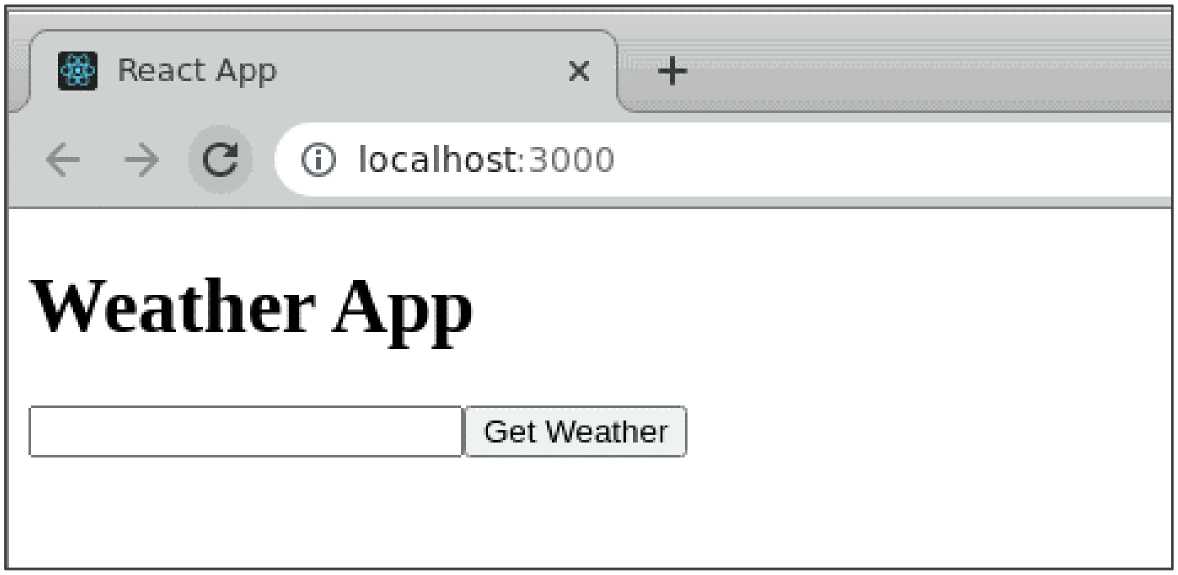
Step 11: Run the app and view it in the browser

11.1 In the terminal, navigate to the project directory

11.2 Run the command **npm start** to start the development server

11.3 Open your browser and navigate to http://localhost:3000

The app should be running, and you should see a simple weather app where you can enter a city and get the current weather data displayed



The above code demonstrates the use of Redux for state management, Redux Thunk for handling asynchronous actions, and Axios for making HTTP requests. It enables users to input a city to fetch and display the current weather data. The application adheres to best practices, organizing concerns into separate files and components for improved maintainability and reusability.

With this, you have successfully built a React application that demonstrates data retrieval using Redux.