

PROFESSIONAL TRAINING REPORT
at
Sathyabama Institute of Science and Technology
(Deemed to be University)

Submitted in partial fulfillment of the requirements for the award
of Bachelor of Engineering Degree in Information Technology

By

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DEPARTMENT OF INFORMATION TECHNOLOGY
SCHOOL OF COMPUTING
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April 2022



**SATHYABAMA INSTITUTE OF SCIENCE AND
TECHNOLOGY**
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DEPARTMENT OF INFORMATION TECHNOLOGY

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **SARANYA.M**
(Reg. No: 39120103) who carried out the project entitled “**BMI**
CALCULATOR APPLICATION USING REACTJS” under my supervision
from March 2022 to April 2022.

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External Examiner

DECLARATION

I, **SARANYA M** hereby declare that the project report entitled “**BMI CALCULATOR APPLICATION USING REACTJS**” done by me under the guidance of **Dr. P.AJITHA,M.E.,Ph.D.**, is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering Degree in Information Technology.

DATE:

PLACE:

SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to **Board of Management** of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

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I would like to express my sincere and deep sense of gratitude to my Project Guide **Dr.P.AJITHA,M.E.,Ph.D.,** for her valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

TRAINING CERTIFICATE



CERTIFICATE

OF APPRECIATION



*AlgoxFusion recognizes the hard work and
dedication of*

Saranya M

*for the successful completion of an online course and a mini-project on
"ReactJS" in association with "PRIDE - SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY" from Feb 23, 2022 to April 6, 2022.*



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ABSTRACT

ReactJS is a part based library which is conveyed for the advancement of intelligent UIs. Presently it is the most famous front-end JS library. It consolidates the view (V) layer in M-V-C (Model View Controller) design. It is bolstered by Facebook, Instagram and a network of individual designers and associations. Respond fundamentally empowers advancement of enormous and complex online applications which can change its information without ensuing page revives. It focusesto furnish better client encounters and with blasting quick and powerful web applications advancement. ReactJS can likewise coordinated with other JavaScript libraries or structures in MVC, for example, AngularJS.

The BMI Calculator App is a software application which avoids more manual hours that need to spend in personally calculate and find the BMI for a particular person at a single click. This application keeps both the standard in it ie American standard and Indian standard too.This app gives us all the information in both the standards which is not given in existing app.The main scope is to maintain the health. The BMI App gives us all the information ie it gives suggestion for our health and tells us what should we eat and what to avoid. When we enter the height and weight we get all the information ie are we overweight or underweight etc.

KEYWORDS: Android, Calculator, Application, Smartphones.

Start to design your webpage by feeding HTML components. To make the webpage more attractive to add the CSS (Cascading Style Sheet).Your form will be displayed with a feeded features and design.Make the webpage dynamic by adding JavaScript (Link HTML with JS). Add REACT components to get a input from the user and perform the require BMI Operation.The final result is your BMI value.

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LIST OF ABBREVIATIONS

ABBREVIATIONS	EXPANSIONS
HTML	HyperText Markup Language
CSS	Cascading Style Sheet
JS	JavaScript
BMI	Body Mass Index
NPM	Node Package Manager

CHAPTER 1

INTRODUCTION

ReactJS is a declarative, efficient, and flexible JavaScript library for building reusable UI components. It is an open-source, component-based front end library responsible only for the view layer of the application. It was created by **Jordan Walke**, who was a software engineer at **Facebook**. It was initially developed and maintained by Facebook and was later used in its products like **WhatsApp & Instagram**. Facebook developed ReactJS in **2011** in its newsfeed section, but it was released to the public in the month of **May 2013**.

A ReactJS application is made up of multiple components, each component responsible for outputting a small, reusable piece of HTML code. The components are the heart of all React applications. These Components can be nested with other components to allow complex applications to be built of simple building blocks. ReactJS uses virtual DOM based mechanism to fill data in HTML DOM. The virtual DOM works fast as it only changes individual DOM elements instead of reloading complete DOM every time.

To create React app, we write React components that correspond to various elements. We organize these components inside higher level components which define the application structure. For example, we take a form that consists of many elements like input fields, labels, or buttons. We can write each element of the form as React components, and then we combine it into a higher-level component, i.e., the form component itself. The form components would specify the structure of the form along with elements inside of it.

1.1 REACTJS FEATURES

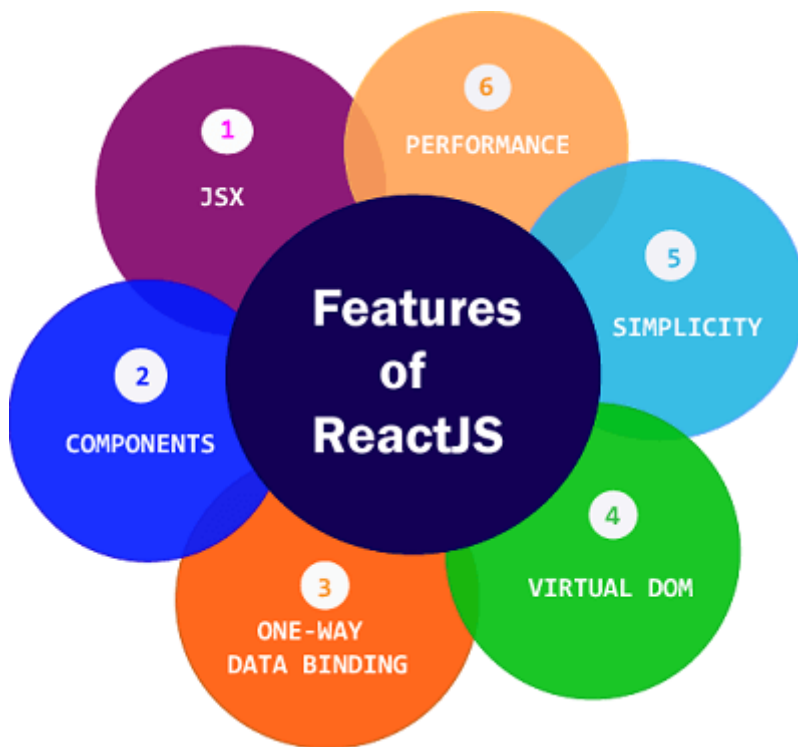


Fig.,1.1 Features of Reactjs

Currently, ReactJS gaining quick popularity as the best JavaScript framework among web developers. It is playing an essential role in the front-end ecosystem. The important features of ReactJS are as following.

- JSX
- Components
- One-way Data Binding
- Virtual DOM
- Simplicity
- Performance

JSX

JSX stands for JavaScript XML. It is a JavaScript syntax extension. Its an XML or HTML like syntax used by ReactJS. This syntax is processed into JavaScript calls of React Framework. It extends the ES6 so that HTML like text can co-exist with JavaScript react code. It is not necessary to use JSX, but it is recommended to use in ReactJS.

Components

ReactJS is all about components. ReactJS application is made up of multiple components, and each component has its own logic and controls. These components can be reusable which help you to maintain the code when working on larger scale projects.

One-way Data Binding

ReactJS is designed in such a manner that follows unidirectional data flow or one-way data binding. The benefits of one-way data binding give you better control throughout the application. If the data flow is in another direction, then it requires additional features. It is because components are supposed to be immutable and the data within them cannot be changed. Flux is a pattern that helps to keep your data unidirectional. This makes the application more flexible that leads to increase efficiency.

Virtual DOM

A virtual DOM object is a representation of the original DOM object. It works like a one-way data binding. Whenever any modifications happen in the web application, the entire UI is re-rendered in virtual DOM representation. Then it checks the difference between the previous DOM representation and new DOM. Once it has done, the real DOM will update only the things that have actually changed. This makes the application faster, and there is no wastage of memory.

Simplicity

ReactJS uses JSX file which makes the application simple and to code as well as understand. We know that ReactJS is a component-based approach which makes the code reusable as your need. This makes it simple to use and learn.

Performance

ReactJS is known to be a great performer. This feature makes it much better than other frameworks out there today. The reason behind this is that it manages a virtual DOM. The DOM is a cross-platform and programming API which deals with HTML, XML or XHTML. The DOM exists entirely in memory. Due to this, when we create a component, we did not write directly to the DOM. Instead, we are writing virtual components that will turn into the DOM leading to smoother and faster performance.

1.2 KEY BENEFITS OF REACTJS

- Speed. ...
- Flexibility. ...
- Performance. ...
- Usability. ...
- Reusable Components. ...
- It's easy to learn. ...
- It helps to build rich user interfaces. ...
- It allows writing custom components.

CHAPTER – 2

REACTJS INSTALLATION

1. NodeJS and NPM
2. React and React DOM
3. Webpack
4. Babel

2.1 WAY TO INSTALL REACTJS

There are two ways to set up an environment for successful ReactJS application. They are given below.

1. Using the npm command
2. Using the create-react-app command

Install NodeJS and NPM

NodeJS and NPM package manager by the link given below NodeJS and NPM are the platforms need to develop any ReactJS application. You can install.

To verify NodeJS and NPM, use the command

- Node -v
- Npm -v

Install React and React DOM

Create a **root** folder with the name **reactApp** on the desktop or where you want. Here, we create it on the desktop. You can create the folder directly or using the command given below.

Now, you need to create a **package.json** file. To create any module, it is required to generate a package.json file in the project folder. To do this, you need to run the following command.

- npm init -y

After creating a package.json file, you need to install **react** and its DOM **packages** using the following npm command.

- npm install react react-dom --save

2.2 REACT CREATE – REACT – APP

The **create-react-app** is an excellent tool for beginners, which allows you to create and run React project very quickly. It does not take any configuration manually. This tool is wrapping all of the required dependencies like **Webpack**, **Babel** for React project itself and then you need to focus on writing React code only. This tool sets up the development environment, provides an excellent developer experience, and optimizes the app for production.

REQUIREMENTS

The Create React App is maintained by **Facebook** and can works on any **platform**, for example, macOS, Windows, Linux, etc. To create a React Project using create-react-app, you need to have installed the following things in your system.

1. Node version ≥ 8.10
2. NPM version ≥ 5.6

Let us check the current version of **Node** and **NPM** in the system.

2.3 INSTALLATION

Install REACT

We can install React using npm package manager by using the following command. There is no need to worry about the complexity of React installation. The create-react-app npm package manager will manage everything, which needed for React project.

```
C:\Users\saranya> npm install -g create-react-app
```

Create a new React project

Once the React installation is successful, we can create a new React project using create-react-app command. Here, I choose "reactproject" name for my project.

```
C:\Users\saranya> create-react-app bmi-calculator-react
```

```
C:\Users\saranya> npx create-react-bmi-calculator-react
```

The above command will take some time to install the React and create a new project with the name "reactproject."

The React project is created successfully on our system. Now, we need to start the server so that we can access the application on the browser. Type the following command in the terminal window.

1. \$ cd Desktop
2. \$ npm start

NPM is a package manager which starts the server and access the application at default server <http://localhost:3000>.

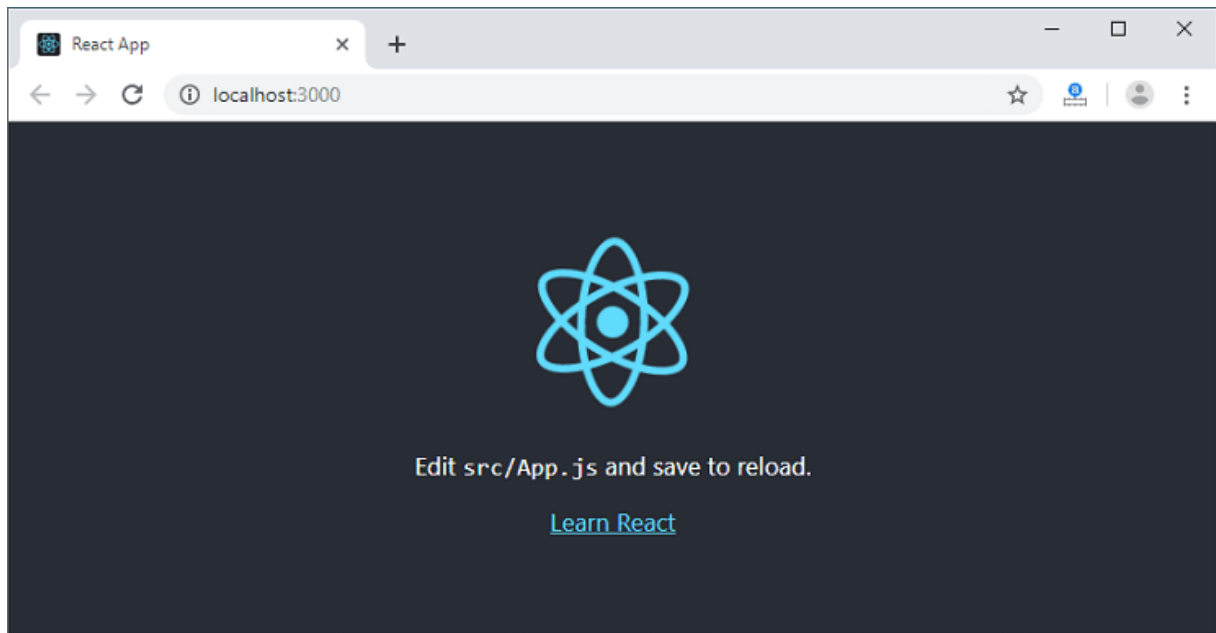


Fig.,1.2 React url page

Next, open the project on Code editor. Here, I am using Visual Studio Code. Our project's default structure looks like as below image.

Requirements of Application:

- a) Create a workspace with VS Code
- b) Design the general layout with HTML & CSS
- c) Create the required components with React JS.

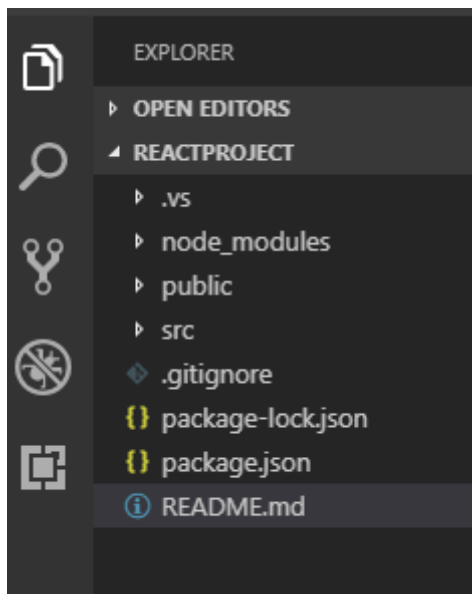


Fig., 1.3 Explorer of react.

In React application, there are several files and folders in the root directory. Some of them are as follows:

1. **node_modules:** It contains the React library and any other third party libraries needed.
2. **public:** It holds the public assets of the application. It contains the index.html where React will mount the application by default on the `<div id="root"></div>` element.
3. **src:** It contains the App.css, App.js, App.test.js, index.css, index.js, and serviceWorker.js files. Here, the App.js file always responsible for displaying the output screen in React.
4. **package-lock.json:** It is generated automatically for any operations where npm package modifies either the node_modules tree or package.json. It cannot be published. It will be ignored if it finds any other place rather than the top-level package.
5. **package.json:** It holds various metadata required for the project. It gives information to npm, which allows to identify the project as well as handle the project's dependencies.
6. **README.md:** It provides the documentation to read about React topics.

CHAPTER – 3

BMI CALCULATOR APPLICATION USING REACTJS

To Create an application for calculating BMI using React JS

- Body Mass Index (BMI) is a person's weight in kilograms divided by the square of height in meters
- It is a measure to classify people under the following categories: underweight, normal weight, overweight and obese. It is the ratio of your weight in kilograms to the square of your height in meters. People with high BMI have too much body weight or body fat for their height.
- BMI gives you a rough estimate of your overall fitness and possibility of developing chronic diseases like heart disease, high blood pressure, osteoarthritis, type 2 diabetes, gallstones etc.
- A highly muscular person may have a high BMI without any health risk. BMI was introduced in the 1830s by Lambert Adolphe Jacques Quetelet, a Belgian mathematician. It is also known as Quetelet index.

3.1 OBJECTIVE

- BMI is a screening tool that can indicate whether a person is underweight or if they have a healthy weight, excess weight, or obesity.
- Scope of the project is to find the variation of health between people.

BMI Categories

- BMI ≤ 18.5 indicates Underweight
- BMI = 18.5-24.9 indicates Normal weight
- BMI = 25-29.9 indicates Overweight
- BMI = 30-34.9 indicates Obesity
- BMI = 35-39.9 indicates severely obese
- BMI > 40 indicates morbid obesity

How to calculate BMI

To calculate BMI, you are required to have two values: a person's height in meters and his weight in kilograms. If the height is in inches, weight should be in pounds. The formula to calculate BMI is as follows:

$$\text{BMI} = \text{weight in kilograms} / (\text{height in meters})^2$$

3.2 Limitations of BMI

Although BMI is a widely used and useful indicator of healthy body weight, it does have its limitations. Due to a wide variety of body types as well as distribution of muscle, bone mass, and fat, BMI should be considered along with other measurements rather than being used as the sole method for determining a person's healthy body weight.

In adults:

BMI cannot be fully accurate because it is a measure of excess body weight, rather than excess body fat. BMI is further influenced by factors such as age, sex, ethnicity, muscle mass, and body fat, and activity level, among others. For example, an older person who is considered a healthy weight, but is completely inactive in their daily life may have significant amounts of excess body fat even though they are not heavy.

In children and adolescents:

The same factors that limit the efficacy of BMI for adults can also apply to children and adolescents. Additionally, height and level of sexual maturation can influence BMI and body fat among children. BMI is a better indicator of excess body fat for obese children than it is for overweight children, whose BMI could be a result of increased levels of either fat or fat-free mass (all body components except for fat, which includes water, organs, muscle, etc.).

3.3 BMI RUNNING OPERATION

Add REACT components to get a input from the user and perform the require BMI Operation. The final result is your BMI value.

STEPS TO FOLLOW

- Open VS code, from scratch we have to write the code.
- Create a folder named Bmi-calculator-react
- Open the folder in VS Code and start creating files inside the folder.
- First we create app.js file to design our layout.
- Next we write our code in index.css file to design colors and fonts.
- Then we have to write a code for index.js to make our page static to dynamic.
- Finally write a code to app.js to design the page.
- Create a folder named assets and put the output pictures inside the folder.

Based on your given inputs, It will calculate your BMI and displays it on the screen.

BMI formula

$$\text{BMI} = \frac{\text{Weight in kg}}{\text{Height in meters squared}}$$

CHAPTER - 4

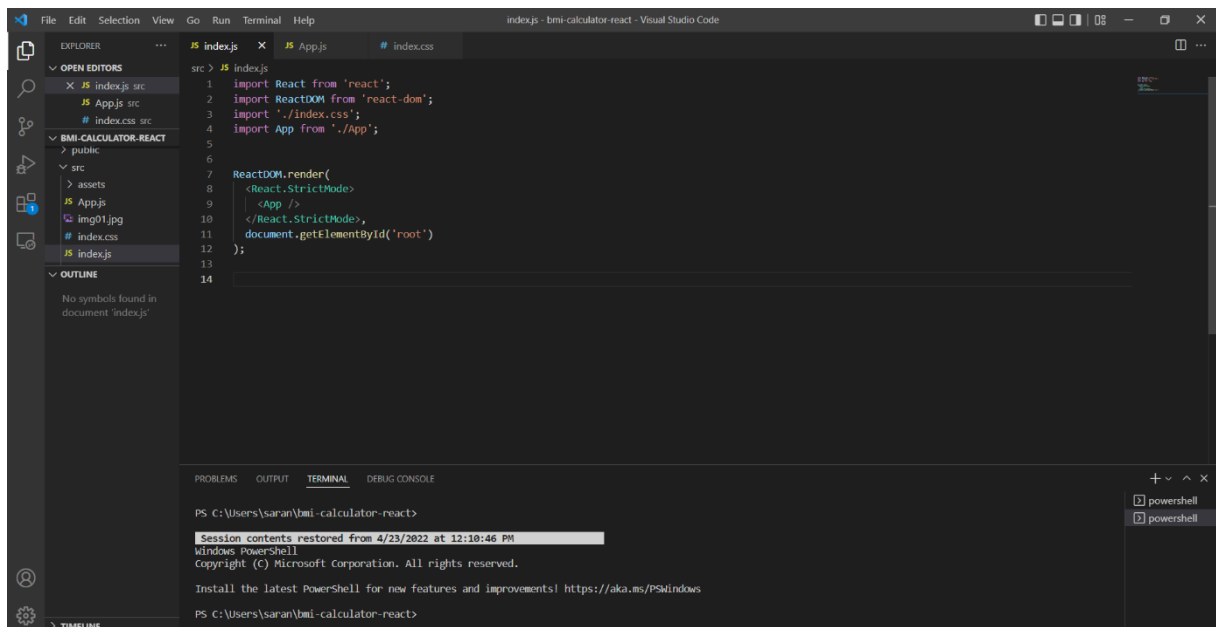
RESULT AND CONCLUSION

4.1 RESULT

The package was created in such a way that future changes are simple to implement. The following conclusions can be drawn from the project's progress. The efficiency of the entire system is improved by automating it. It has a user-friendly graphical user interface that outperforms the current system. It grants authorised users appropriate access based on their permissions. It effectively solves the problem of time complexity. It has never been easier to keep information up to date. The most notable features are system security, data security, and dependability. If necessary, the System has enough flexibility to be modified in the future.

4.2 SOURCE CODE

Index.js



```
File Edit Selection View Go Run Terminal Help
indexjs - bmi-calculator-react - Visual Studio Code

EXPLORER
  OPEN EDITORS
    indexjs src
    Appjs src
    index.css src
  BMI-CALCULATOR-REACT
    public
    src
      assets
      Appjs
      img01.jpg
      index.css
      indexjs
  OUTLINE
    No symbols found in document 'indexjs'

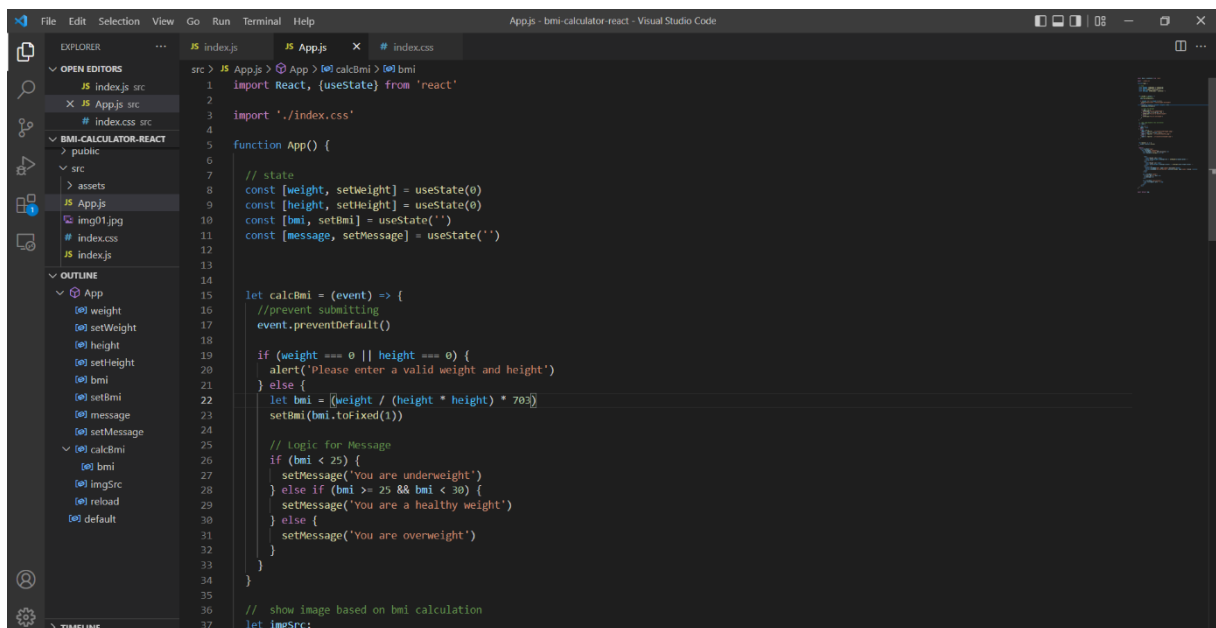
src > indexjs
1 import React from 'react';
2 import ReactDOM from 'react-dom';
3 import './index.css';
4 import App from './App';
5
6
7 ReactDOM.render(
8   <React.StrictMode>
9     <App />
10   </React.StrictMode>,
11   document.getElementById('root')
12 );
13
14

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE
PS C:\Users\saran\bmi-calculator-react>
Session contents restored from 4/23/2022 at 12:10:46 PM
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

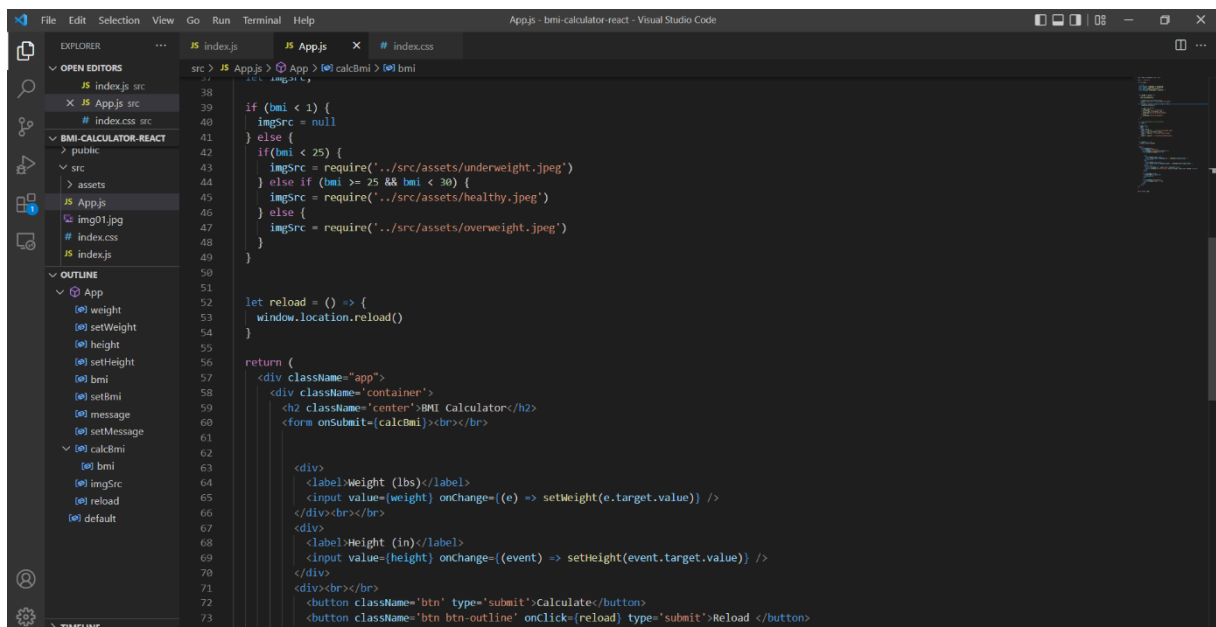
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\saran\bmi-calculator-react>
```

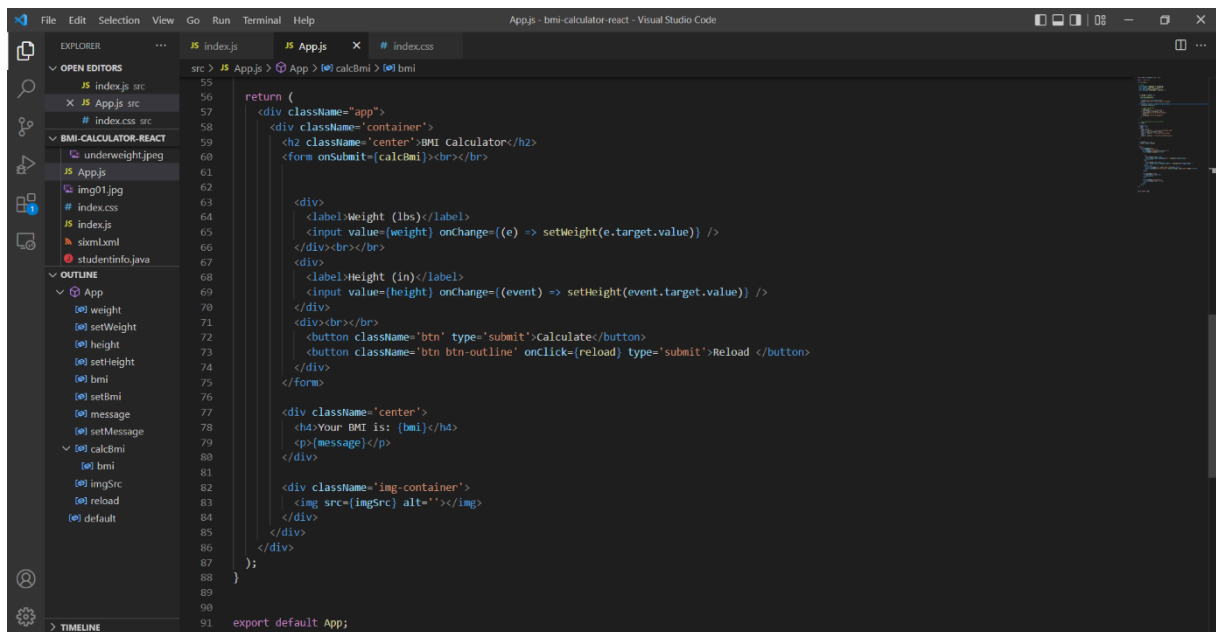
App.js



```
src > App.js > App > calcBmi > bmi
1 import React, {useState} from 'react'
2
3 import './index.css'
4
5 function App() {
6
7   // state
8   const [weight, setWeight] = useState(0)
9   const [height, setHeight] = useState(0)
10  const [bmi, setBmi] = useState('')
11  const [message, setMessage] = useState('')
12
13
14
15  let calcBmi = (event) => {
16    //prevent submitting
17    event.preventDefault()
18
19    if (weight === 0 || height === 0) {
20      alert('Please enter a valid weight and height')
21    } else {
22      let bmi = (weight / (height * height) * 703)
23      setBmi(bmi.toFixed(1))
24
25      // Logic for Message
26      if (bmi < 25) {
27        setMessage('You are underweight')
28      } else if (bmi >= 25 && bmi < 30) {
29        setMessage('You are a healthy weight')
30      } else {
31        setMessage('You are overweight')
32      }
33    }
34  }
35
36  // show image based on bmi calculation
37  let imgSrc;
```



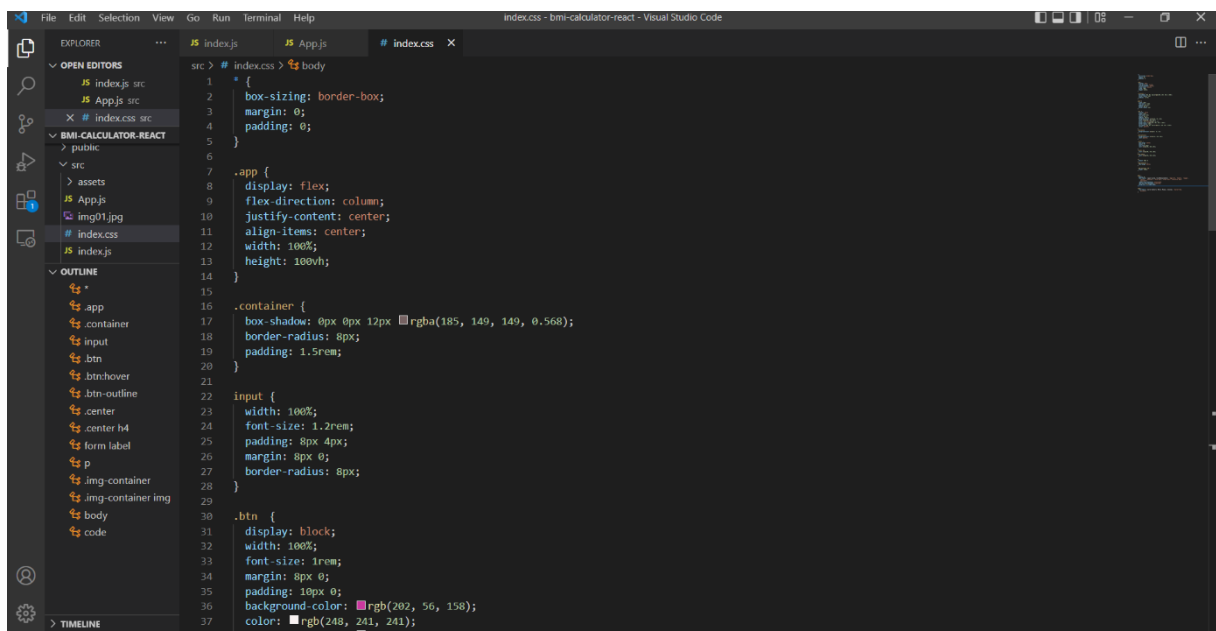
```
src > App.js > App > calcBmi > bmi
38
39 if (bmi < 1) {
40   imgSrc = null
41 } else {
42   if (bmi < 25) {
43     imgSrc = require('../src/assets/underweight.jpeg')
44   } else if (bmi >= 25 && bmi < 30) {
45     imgSrc = require('../src/assets/healthy.jpeg')
46   } else {
47     imgSrc = require('../src/assets/overweight.jpeg')
48   }
49 }
50
51
52 let reload = () => {
53   window.location.reload()
54 }
55
56 return (
57   <div className="app">
58     <div className="container">
59       <h2 className="center">BMI Calculator</h2>
60       <form onSubmit={calcBmi}><br></form>
61
62       <div>
63         <label>Weight (lbs)</label>
64         <input value={weight} onChange={(e) => setWeight(e.target.value)} />
65       </div><br></div>
66
67       <div>
68         <label>Height (in)</label>
69         <input value={height} onChange={(event) => setHeight(event.target.value)} />
70       </div>
71
72       <div><br></div>
73       <button className="btn" type="submit">Calculate</button>
74       <button className="btn btn-outline" onClick={reload} type="submit">Reload </button>
75     </div>
76   </div>
77 )
```



The screenshot shows the Visual Studio Code editor with the 'App.js' file open. The file contains a React component named 'App' that renders a BMI calculator form. The form includes input fields for weight and height, buttons for 'Calculate' and 'Reload', and a display area for the BMI result. The component uses state management with 'useState' and 'useEffect' hooks. The 'App' component is exported as the default export.

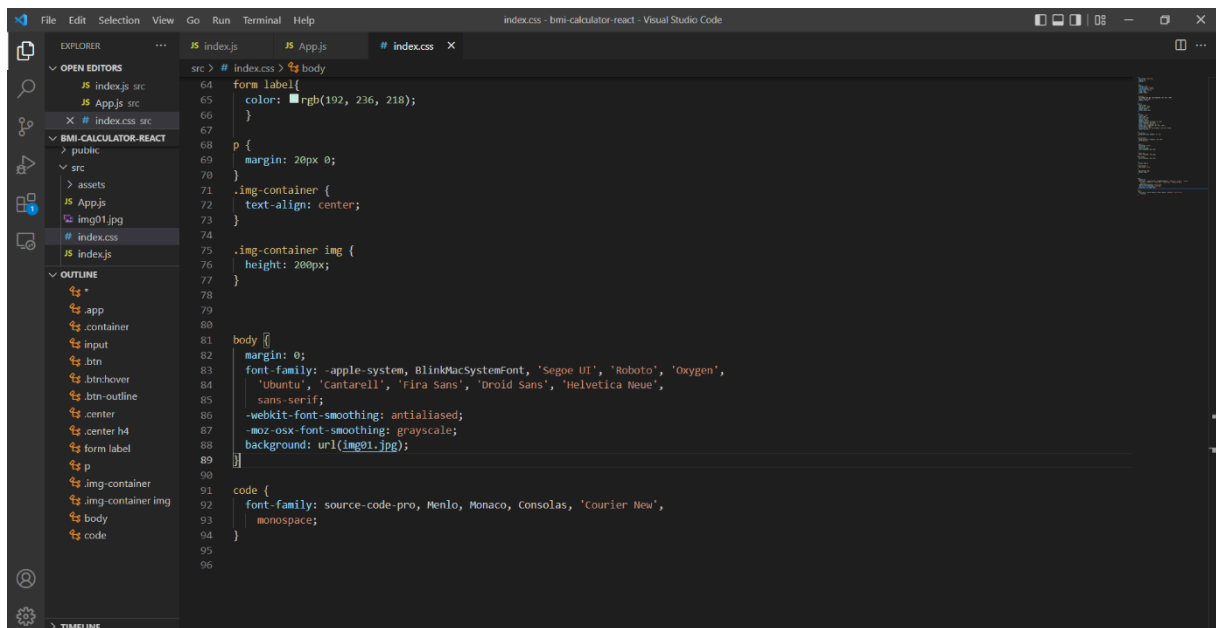
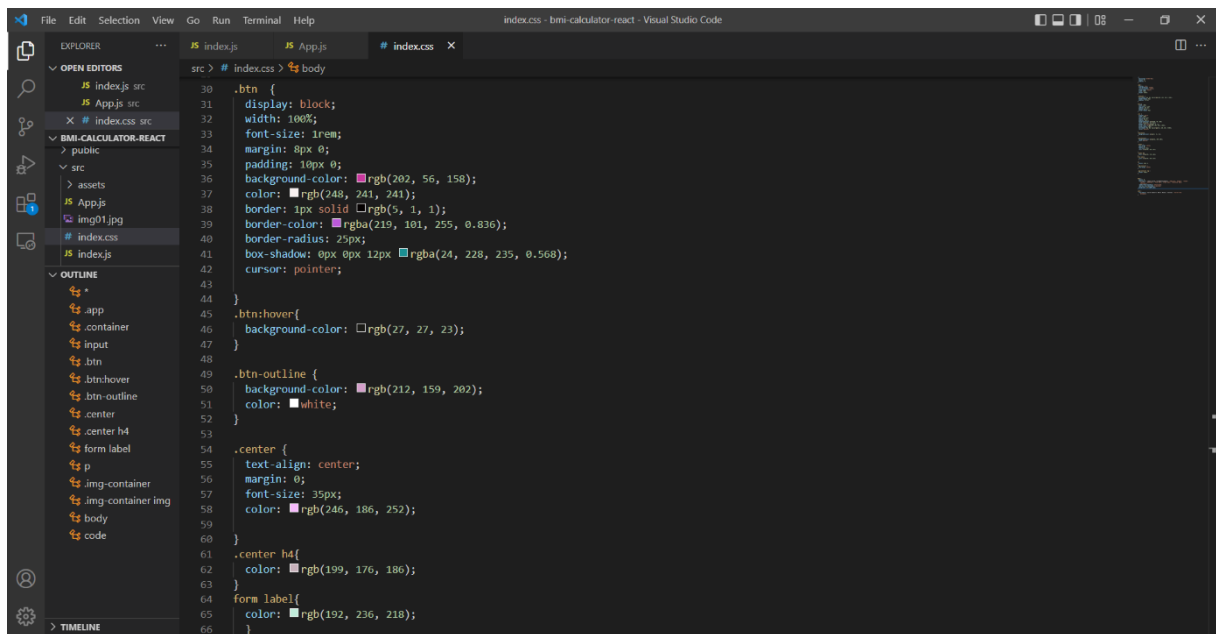
```
55 return (  
56   <div className="app">  
57     <div className="container">  
58       <h2 className="center">BMI Calculator</h2>  
59       <form onSubmit={calcBmi}><br></br>  
60  
61         <div>  
62           <label>Weight (lbs)</label>  
63           <input value={weight} onChange={(e) => setWeight(e.target.value)} />  
64         </div><br></br>  
65         <div>  
66           <label>Height (in)</label>  
67           <input value={height} onChange={(event) => setHeight(event.target.value)} />  
68         </div><br></br>  
69         <button className="btn" type="submit">Calculate</button>  
70         <button className="btn btn-outline" onClick={reload} type="submit">Reload </button>  
71       </form>  
72  
73       <div className="center">  
74         <h4>Your BMI is: {bmi}</h4>  
75         <p>{message}</p>  
76       </div>  
77  
78       <div className="img-container">  
79         <img src={imgSrc} alt="" />  
80       </div>  
81     </div>  
82   </div>  
83 );  
84  
85 export default App;
```

Index.css

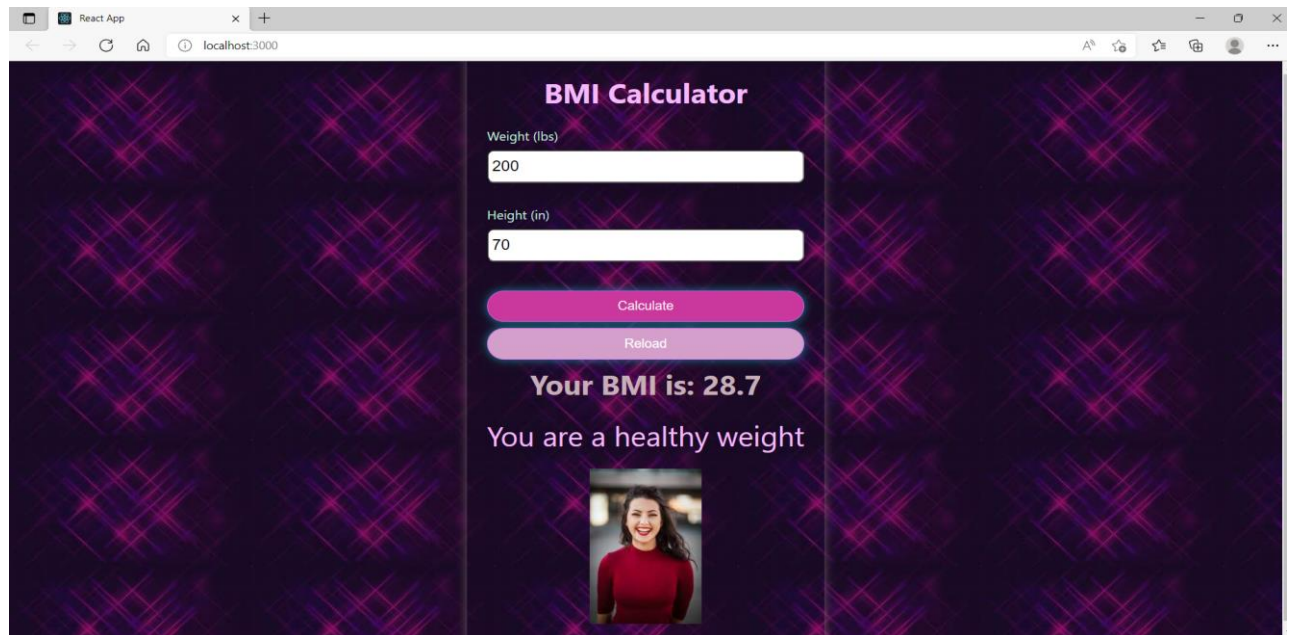


The screenshot shows the Visual Studio Code editor with the 'index.css' file open. The file contains CSS rules for the BMI calculator application. The rules define the styling for the body, the app container, the main container, the input fields, the buttons, and the BMI result display. The styles include flexbox layout, font sizes, padding, margin, and background colors.

```
1 {  
2   box-sizing: border-box;  
3   margin: 0;  
4   padding: 0;  
5 }  
6  
7 .app {  
8   display: flex;  
9   flex-direction: column;  
10  justify-content: center;  
11  align-items: center;  
12  width: 100%;  
13  height: 100vh;  
14 }  
15  
16 .container {  
17   box-shadow: 0px 0px 12px rgba(185, 149, 149, 0.568);  
18   border-radius: 8px;  
19   padding: 1.5rem;  
20 }  
21  
22 input {  
23   width: 100%;  
24   font-size: 1.2rem;  
25   padding: 8px 4px;  
26   margin: 8px 0;  
27   border-radius: 8px;  
28 }  
29  
30 .btn {  
31   display: block;  
32   width: 100%;  
33   font-size: 1rem;  
34   margin: 8px 0;  
35   padding: 10px 0;  
36   background-color: #f0f0f0;  
37   color: #333333;
```



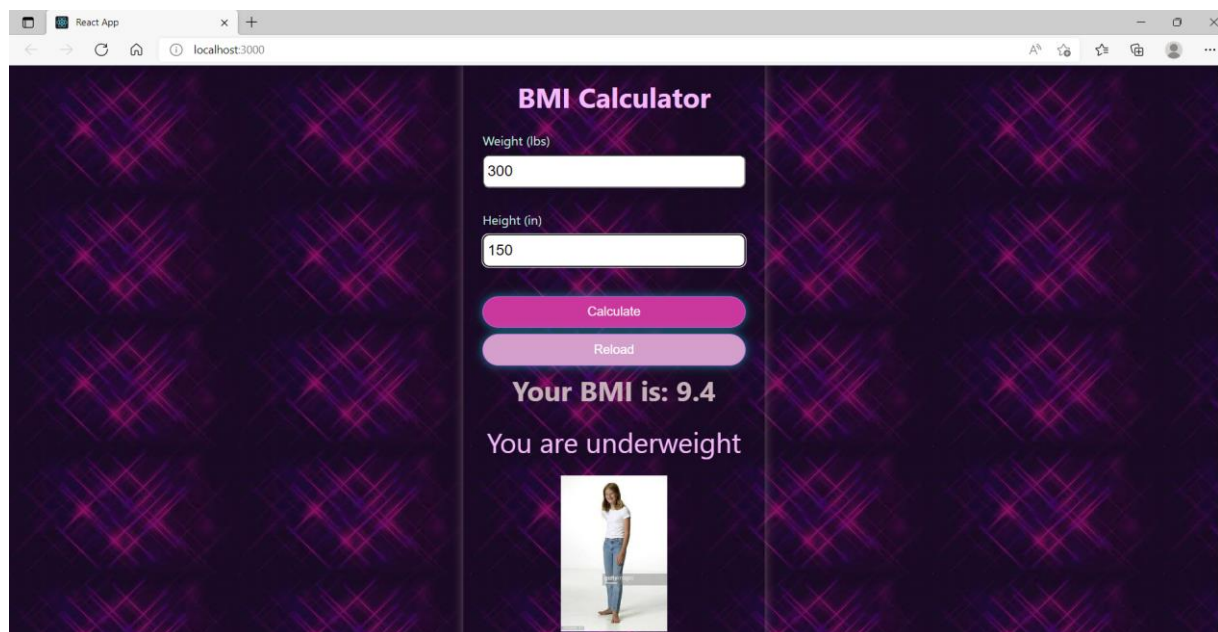
4.3 CALCULATION SNAPSHOTS



A screenshot of a web browser displaying a BMI Calculator application. The browser's address bar shows 'localhost:3000'. The application has a dark purple background with a repeating geometric pattern. The title 'BMI Calculator' is at the top in white. Below it, there are two input fields: 'Weight (lbs)' with the value '200' and 'Height (in)' with the value '70'. There are two buttons: a pink 'Calculate' button and a light purple 'Reload' button. Below the buttons, the text 'Your BMI is: 28.7' is displayed in white, followed by 'You are a healthy weight' in a lighter shade. At the bottom, there is a small image of a smiling woman with dark hair wearing a red turtleneck sweater.

Normal weight

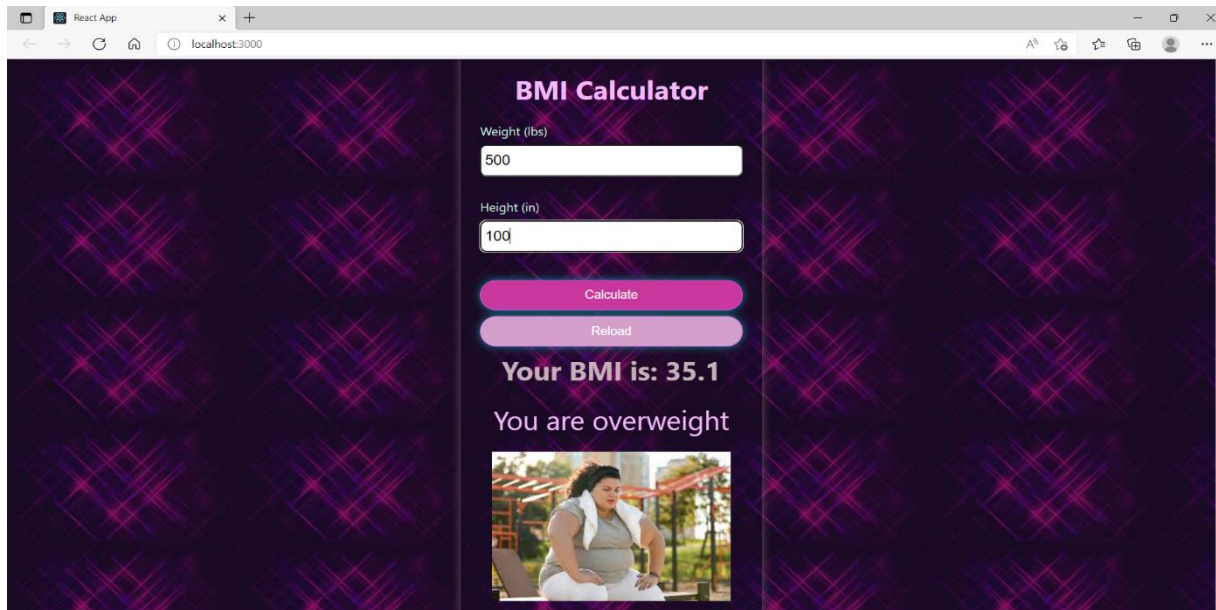
The BMI of the given value is Normal.



A screenshot of the same BMI Calculator web application. The 'Weight (lbs)' input field now contains '300' and the 'Height (in)' input field contains '150'. The 'Calculate' button is still pink and the 'Reload' button is still light purple. Below the buttons, the text 'Your BMI is: 9.4' is displayed in white, followed by 'You are underweight' in a lighter shade. At the bottom, there is a small image of a woman standing, wearing a white t-shirt and blue jeans.

Under weight

The BMI of the given value is under the normal value.



Over weight

The BMI of the given value is Over the normal value.

4.4 CONCLUSION

BMI is a useful measure of overweight and obesity. It is calculated from your height and weight. BMI is an estimate of body fat and a good gauge of your risk for diseases that can occur with more body fat. The higher your BMI, the higher your risk for certain diseases such as heart disease, high blood pressure, type 2 diabetes, gallstones, breathing problems, and certain cancers.

Although BMI can be used for most men and women, it does have some limits:

- It may overestimate body fat in athletes and others who have a muscular build
- It may underestimate body fat in older persons and others who have lost muscle.

4.5 REFERENCE

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