Let’s Get Hooked! (Namaste-React)

💡 Please make sure to follow along with the whole ***”Namaste React"*** series, starting from Episode-1 and continuing through each subsequent episode. The notes are designed to provide detailed explanations of each concept along with examples to ensure thorough understanding. Each episode builds upon the knowledge gained from the previous ones, so starting from the beginning will give you a comprehensive understanding of React development.

💡 I've got a quick tip for you. To get the most out of these notes, it's a good idea to watch **Episode-5** first. Understanding what ***”Akshay”*** shares in the video will make these notes way easier to understand.

> **So far, here's what we've learned in the previous episode**
>
> - We built a food ordering app that displayed restaurant cards using real-time data from an API (like Swiggy's).
> - We also explored the concept of config-driven UI.

Before we start to learn today's episode, a common question many of us may encounter is:

Q) Why do we use React? Some of us might wonder why we don't just stick to HTML, CSS, and JAVASCRIPT for everything we've been doing?

👉🏽 Of course! It's absolutely possible to accomplish everything using regular ***HTML, CSS*** and ***JAVASCRIPT*** without using ***REACT***. However, we chose React because it enhances our developer experience, making it more seamless and efficient.

Part-1

Introducing React-Hooks.

Before we begin, the first thing we need to do is clean up our app. Up until now, we've placed all our components inside a single `App.js` file, but this isn't considered good practice. It's best to create separate files for each component.

Q) How can we achieve this?

To achieve this, Let's discuss the folder structure. Currently, all our files are located at the root level of our project.
(
If you're following along with the course, you can view the current structure of your project on the left side of your code editor)

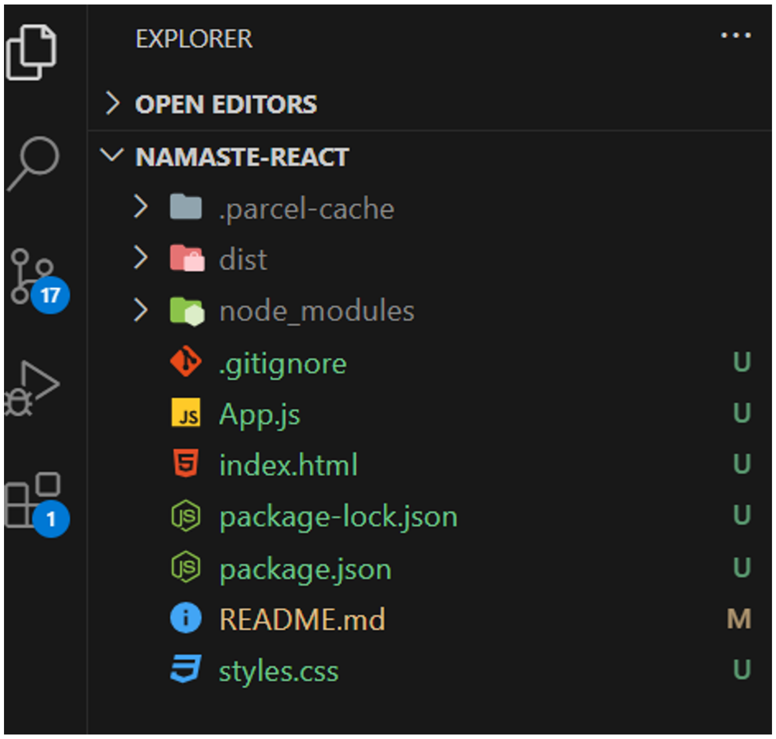


Fig 6.1

We are going to Restructure our project folder **"NAMASTE-REACT"**

- there is a very good convention in the industry that all the code in a React project is kept in a '**src**-folder', there is no compulsion to use a '**src**-*folder*' in a project. But here we are following what the industry follows.
- We are creating and moving our `App.js` file in the '**src**-*folder*' and whatever new files we create we put them in the '**src**-*folder*'.

📢 NOTE: Don't forget to update the path of the `App.js` file in `index.html` other we will get an Error.

The best practice is to make separate files for every component.

We have the following components.

```
1. Header
2. RestaurantCard
3. Body
```

We put all the above components inside the folder named '**components**'(child-folder) which has been placed inside the '**src**- folder'(parent folder). When we are creating separate component files inside the '**components**-folder' always start with a capital letter like.

```
In this course, we are using (.js) as an extension.
1. Header.js
2. RestaurantCard.js
3. Body.js

NOTE: We can use (.jsx) as an extension instead of (.js) it's
```

```
up to the developer's wish.
 1. Header.jsx
 2. RestaurantCard.jsx
 3. Body.jsx
```

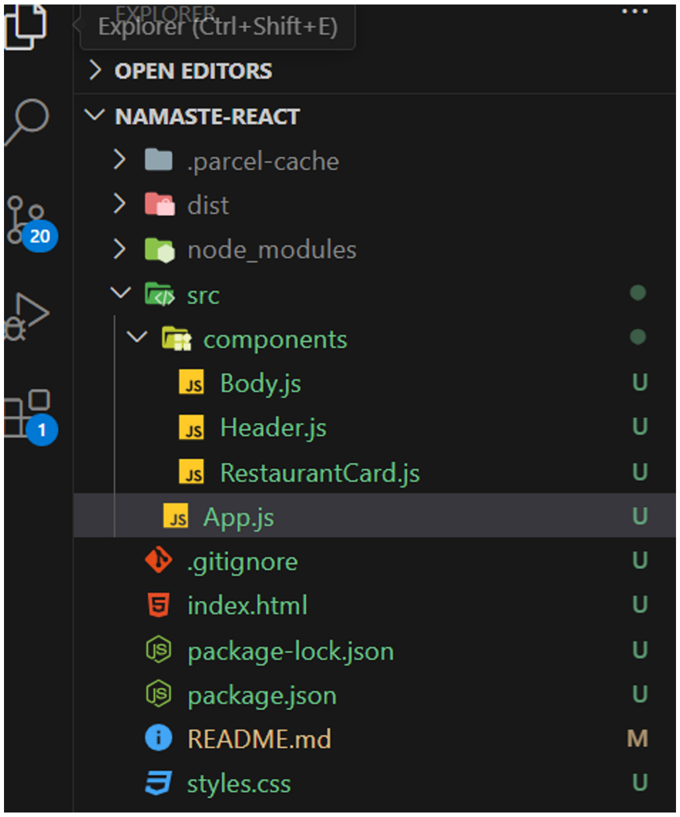


Fig 6.2

📢 NOTE: NO Thumb Rule to use this convention, we could use any folder structure you wish.

Understanding Export and Import in React.

Two types of export/import in React, We will understand each of them in details.

1.Default export/import.
2.Named export/import.

As we know we move each component's code and create new files individually.
Still, Our React project throws an error because our `App.js` file doesn't have components in it and we are using components inside the `App.js`
to solve this we need to import the components from their respective files which have been kept inside the ***components-folder*** in *src*.(refer fig 6.2)

to understand it well let's take an example of the `Header.js` component.

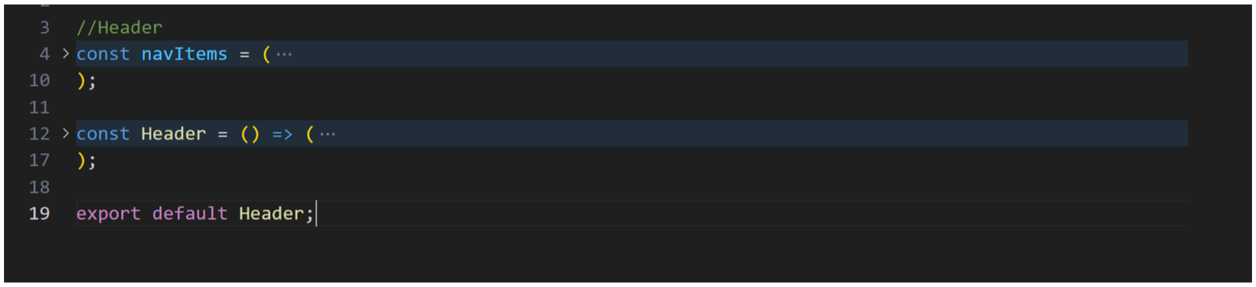
Example:
The
`Header.js` component is missing in `App.js` so we are not able to use it, if we try to use it, It throws an error, To solve this, here we have to import `Header.js` inside the `App.js` and before the import, we have to 1st initially export `Header.js` component.

1.Default export/import. 👇🏾

Step-1 (export)————————>
We use the 'export' and 'default' keywords with the component name at the end of the component file.
In (figure 6.3) on line-no-19 we see that we are exporting Header componet. Understand the Syntax properly.

```
// Syntax
export default Header;
```

```
// Or we can write with extension.
export default Header.js;
```



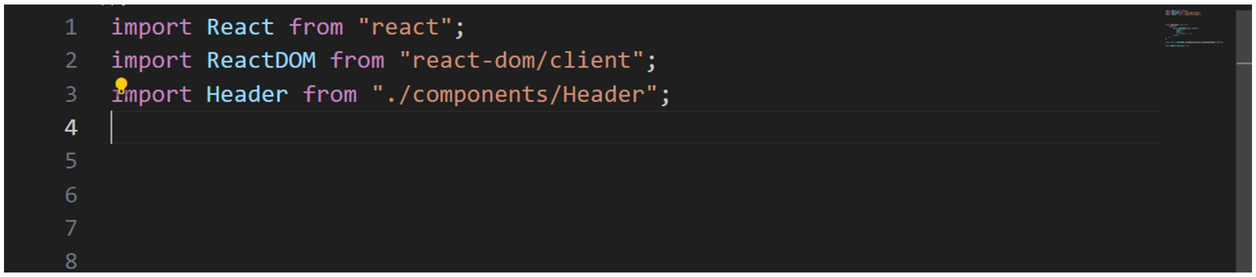
```
//Header
const navItems = (…
);

const Header = () => (…
);

export default Header;
```

Fig 6.3

Step-2 (import)————————>

In (fig 6.4), we import the Header on line-no-3, inside `App.js` We use ‘import’ with the component name at the start of the file. Understand the Syntax properly.

```
// Syntax
import Header from "./components/Header"
```



```
1 import React from "react";
2 import ReactDOM from "react-dom/client";
3 import Header from "./components/Header";
4
5
6
7
8
```

Fig 6.4

📢 NOTE:
1. If you are using Vs-Code Editor during *import* it automatically tracks the path of the component and gives suggestions to us. so we don't have to worry about the path.

2. We don't have to put an extension in the file in the import statement. If want to put then completely Fine.

Follow the same method for the rest of the components.

In the case of RestaurantCard, we are using it inside the body component.
follow the same steps

Step-1 (export)————————> exporting `RestaurantCard.js`

Step-2 (import)————————> Importing `RestaurantCard.js` inside the `Body.js`

If we attempt to run our project, we'll encounter the 'resLists not defined' error.

This happens because '`resList`' is being used inside '`Body.js`' without being defined in that file. While one solution is moving '`resLists`' inside '`Body.js`', it's not considered the best practice.

📢 NOTE:

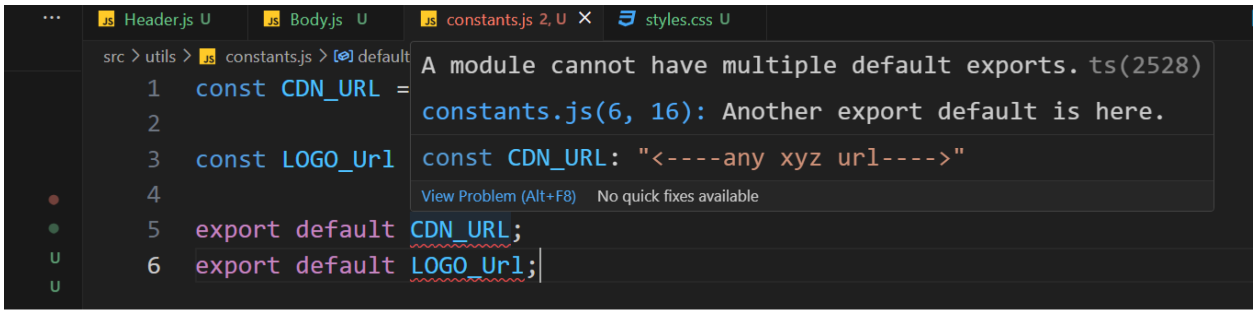
`resList` contains hard-coded data and we never put any hard-coded data like the *source-URL* of *logo* and *images* inside the component file. That's not the best practice the industry follows.

Q) So where should we keep it?

- We've established a new directory within the '**src**' folder called '**utils**', and inside it, we've created a file named '`constants.js`' to store all hard coded data. You can choose any name for this file, but we've opted for lowercase letters since it's not a component. Additionally, we've included the source of logos and images in this file.
- We've stored our mock data for '`resList`' in a file named '`mockData.js`', which resides within the '**utils**' folder.
- We need to export data from '`constants.js`' and '`mockData.js`', and then import it into the necessary component files where it will be used

---

But there's a catch: If we intend to export multiple items simultaneously, from single file 'default export/import' won't work; it'll result in an error (refer Fig 6.5). For instance, in our '`constants.js`' file, we've stored `URLs` for logos and images using separate variables, which means default export/import won't be feasible (refer Fig 6.5).



```
const CDN_URL =

const LOGO_Url

export default CDN_URL;
export default LOGO_Url;
```

```
A module cannot have multiple default exports. ts(2528)
constants.js(6, 16): Another export default is here.
const CDN_URL: "<----any xyz url---->"
View Problem (Alt+F8)    No quick fixes available
```

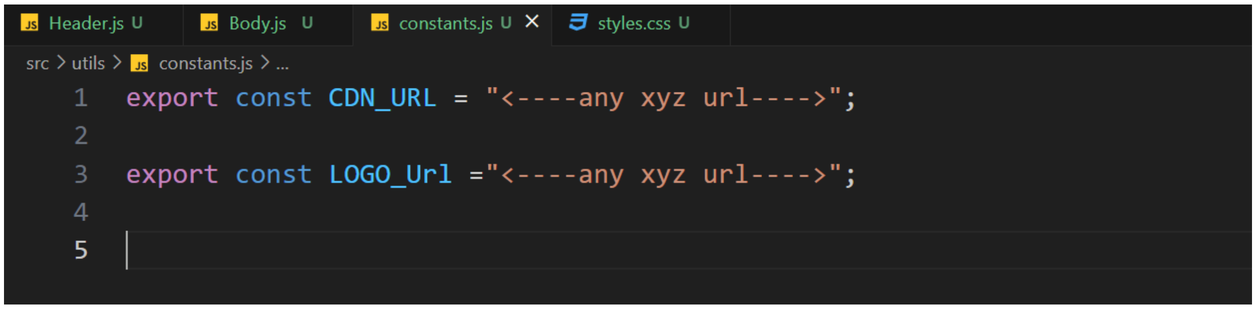
Fig 6.5

Instead, we can employ 'named export/import' to handle this scenario effectively.

2.Named export/import. 👇🏾

just write the ‘`export`’ keyword before the variables we want to export (refer Fig 6.6). We won’t get any error.

Step-1 (export)————————>



```
export const CDN_URL = "<----any xyz url---->";

export const LOGO_Url ="<----any xyz url---->";

```

Fig 6.6

Step-2 (import)————————>

when we import there is a slight difference in syntax we use curly braces.

- We import LOGO_URL inside the `Header.js` and
- Import the CDN_URL inside the `RestaurantCard.js`

```
import { LOGO_URL } from "../utils/constants";
```

```
import { CDN_URL } from "../utils/constants";
```

Q) Can we use default export with named export ?

👉 yes

Part-2

Let's make our app more lively and engaging.

In this tutorial series, we're learning by actually building things. As we go along, we'll keep adding new features to our app.

For now, we're going to add a button. When you click on this button, it will show you the best-rated restaurants.

Inside the body component, instead of having a search box, let's replace it with a '`<button>`'. We'll add this button inside a '`<div>`' and give it any class name we want. Similarly, we'll also give a class name to the button, as per our preference.

We are adding
`onclick` evenhandler inside the button, `onclick` has call-back function which will be called when we clicked on the button, there is condition when we clicked on the restaurant we will get a restaurant which avg-rating is more than 4.2 (avg-rating > 4.2)

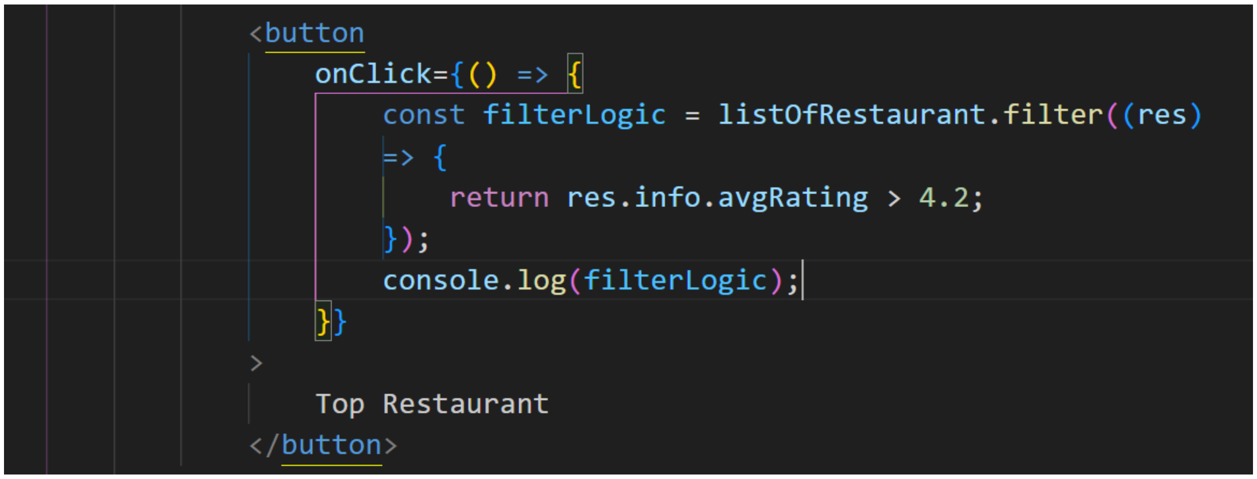
Q) How these cards are coming on the screen?

- These cards are appear on the screen because we're using the **`map()`** method to go through each restaurant in our mock data (**`resList`**). This method helps us display the information from each restaurant on individual cards. so any thing changes in reslist the cards displayed on the screen will also change.

- We're simplifying our mock data to improve our understanding, or you can use the data provided below (which is the actual data from the Swiggy API).

```
let listOfRestaurant = [
  {
    data: {
      id: "255655",
      name: "Cake & Cream",
      cloudinaryImageId: "ac57cc371e73f96f812613f58457aca3",
      areaName: "Jairaj Nagar",
      costForTwo: "₹200 for two",
      cuisines: ["Bakery", "Hot-dog", "pastery", "Cake", "Thi
ck- shake"],
      avgRating: 4.3,
      veg: true,
      parentId: "54670",
      avgRatingString: "4",
      totalRatingsString: "20+",
    },
  },
  {
    data: {
      id: "350363",
      name: "Haldiram's Sweets and Namkeen",
      cloudinaryImageId: "25c3a7d394d6c5556b134385f7d665b0",
      avgRating: 4.6,
      veg: true,
      cuisines: [
        "North Indian",
        "South Indian",
        "Chinese",
        "Pizzas",
        "Fast Food",
      ],
      parentId: "391465",
      avgRatingString: "4.6",
      totalRatingsString: "100+",
    },
  },
  {
    data: {
      id: "154891",
      name: "Rasraj Restaurant",
      cloudinaryImageId: "egbr63ulc8h1zgliivd8",
      locality: "Civil Line",
      areaName: "Civil Lines",
      costForTwo: "₹250 for two",
      cuisines: [
        "North Indian",
        "South Indian",
        "Street Food",
        "Chinese",
        "Pizzas",
        "Fast Food",
      ],
      avgRating: 4.2,
    },
  },
  {
    data: {
      id: "745961",
      name: "Balaji Restaurant",
      cloudinaryImageId: "b8672fe52944c3599ea324d99d608300",
      locality: "Sai Rubber Stamp",
      areaName: "Jairaj Nagar",
      costForTwo: "₹149 for two",
      cuisines: ["South Indian", "North Indian"],
      avgRating: 4.8,
      veg: true,
    },
  },
  {
    data: {
      id: "798745",
      name: "Friends Restaurant",
      cloudinaryImageId: "b14cd9fc40129fcfb97aa7e621719d07",
      locality: "Gayatri Nagar",
      areaName: "Jairaj Nagar",
      costForTwo: "₹150 for two",
      cuisines: ["North Indian", "Chinese", "Biryani", "Tando
or", "Kebabs"],
      avgRating: 4.2,
      parentId: "84308",
    },
  },
  {
    data: {
      id: "314737",
      name: "RASOI the KITCHEN",
      cloudinaryImageId: "yjymo9nhyn7rhvafsrd3",
      locality: "Sriram Chowk",
      areaName: "Bazar Ward",
      costForTwo: "₹200 for two",
      cuisines: ["North Indian", "Maharashtrian", "Chinese",
"Thalis"],
      avgRating: 3.9,
      parentId: "167341",
    },
  },
  {
    data: {
      id: "201454",
      name: "Morsels restaurants",
      cloudinaryImageId: "aafe71251ef5328784652dc838cd91f3",
      locality: "Bazar Ward",
      areaName: "Chandrapur Locality",
      costForTwo: "₹300 for two",
      cuisines: ["North Indian", "South Indian"],
      avgRating: 3.2,
      veg: true,
      parentId: "139266",
      avgRatingString: "4.2",
    },
  },
  {
    data: {
      id: "266124",
      name: "Trimurti Restaurant",
      cloudinaryImageId: "8135c0066b06e2925c66930be4e9ffb5",
      locality: "Bazar Ward",
      areaName: "Chandrapur Locality",
      costForTwo: "₹150 for two",
      cuisines: ["Desserts"],
      avgRating: 3.9,
      veg: true,
      parentId: "217751",
      avgRatingString: "4.4",
    },
  },
  {
    data: {
      id: "509254",
      name: "Saha Restaurant",
      cloudinaryImageId: "z1ez4uc9idul2uj2v87g",
      areaName: "Jairaj Nagar",
      costForTwo: "₹300 for two",
      cuisines: ["North Indian", "Biryani", "Thalis", "Bevera
ges"],
      avgRating: 3.7,
      parentId: "174585",
      avgRatingString: "3.7",
    },
  },
];
```

We utilize the data mentioned above, incorporating a condition within the callback function. This condition triggers when we click on the button, displaying only the restaurants whose average rating is above 4.2 . That’s what we are expecting.



```
<button
    onClick={() => {
        const filterLogic = listOfRestaurant.filter((res)
        => {
            return res.info.avgRating > 4.2;
        });
        console.log(filterLogic);
    }}
>
    Top Restaurant
</button>
```

Fig 6.7

Despite implementing the code in Figure 6.7, no visible changes occur on the screen. However, we successfully filter the data, which we can confirm by checking the filtered results using `console.log(filterlogic).`

📢 Note:
whenever we have react App we have a UI layer and data layer, UI layer will display what is being sent by the data layer.

Q) How can we display filtered restaurants dynamically on UI(display screen) ?

👉 Here, we're utilizing data retrieved from the `listOfRestaurant` variable, which stores an array of objects. It's treated as a regular variable within our codebase. However, for this functionality, we require a superpowerful React variable known as a ‘state variable’.

Q) How do we create Super-powerful variable ?

👉 for that we use ‘React Hooks’.

Q) What is Hook ?

👉 It's simply a regular JavaScript function. However, it becomes powerful when used within React, as it's provided to us by React itself. These pre-built functions have underlying logic developed by React developers. When we install React via npm, we gain access to these superpowers.

Two crucial hooks we frequently utilize are:

1. useState()

2. useEffect()

1. useState()

(import)————————>

- First, we have to import as a named import from ‘react’.
- We are using `useState()` inside the body component to create a ‘state variable‘. Look at the syntax below.

```
import { useState } from "react";
```

```
// syntax of useState()
const [listOfRestaurant] = useState([]);
```

In the provided code, we pass an empty array `[]` as the initial value inside the `useState([])` method. This empty array serves as the default value for the `listOfRestaurant` variable.

If we pass the `listOfRestaurant` were we stored all the restaurant data inside the `useState()` as the default data, it will render the restaurants on the screen using that initial data.

Q) How could we modify the list of restaurant ?

To modify we pass the second argument `setListOfRestaurant` we can name as we wish. `setListOfRestaurant` used to update the list.

```
import { useState } from "react";
// syntax of useState()
const [listOfRestaurant , setListOfRestaurant] = useState
([]);
```

Q) How can we display filtered restaurants dynamically on UI(display screen)? I am repeating the same question which we had previously.

We are using `setListOfRestaurant` inside the call-back function to show the filtered restaurant. on clicking the button we will see the Updated top-rated restaurant.

```
<button
  className="filter-btn"
  onClick={() => {
    const filtertheRestaurant = listOfRestaurant.filter((res)
=> {
      return ( res.data.avgRating > 4));
    });
    setListOfRestaurant(filtertheRestaurant);
  }}
>
  Top Rated Restaurant
</button>;
```

📢 NOTE:
- The crucial point about State variables is that whenever they update, React triggers a reconciliation cycle and re-renders the component.
- This means that as soon as the data layer changes, React promptly updates the UI layer. The data layer is always kept in sync with the UI layer.
- To achieve this rapid operation, React employs a reconciliation algorithm, also known as the diffing algorithm or React-Fibre which we will delve into further below.

React is often praised for its speed, have you ever wondered why? 🤔

At the core lies React-Fiber - a powerhouse reimplementation of React's algorithm. The goal of React Fiber is to increase its suitability for areas like animation, layout, and gestures. Its headline feature is incremental rendering: the ability to split rendering work into chunks and spread it out over multiple frames.

These days, we can use ***JavaScript*** and ***React*** alongside popular libraries like ***GSAP*** (GreenSock Animation Platform) and ***Three.js***.

These tools allow us to create animations and 3D designs using the capabilities of ***JavaScript*** and ***React***.

But how does it all work behind the scenes?

👉🏽 When you create elements in React, you're actually creating ***virtual DOM objects***. These virtual replicas are synced with the **real DOM**, a process known as "Reconciliation" or the React "diffing" algorithm.

Essentially, every rendering cycle compares the new UI blueprint (updated VDOM) with the old one (previous VDOM) and makes precise changes to the actual DOM accordingly.

It's important to understand these fundamentals in order to unlock a world of possibilities for front-end developers!

Do you want to understand and dive deep into it?

👉🏽 Take a look at this awesome React Fiber architecture repository on the web: https://github.com/acdlite/react-fiber-architecture