REACT

React is a JavaScript library (frontend javascript framework) for **building user interfaces**.

React is used to build **single-page applications**.

React allows us to create **reusable UI components.**

React is a tool for **building UI Components.**

Single page applications (SPAs)

A single page application is a website or web application that dynamically rewrites a current web page with new data from the web server, instead of the default method of a web browser loading entire new pages.

examples of single page applications like Gmail, Google Maps, Airbnb, Netflix, Pinterest, Paypal

A single page application is a single page (hence the name) where a lot of information stays the same and only a few pieces need to be updated at a time.

For example, when you browse through your email, you'll notice that not much changes during navigation — the sidebar and header remain untouched as you go through your inbox.

The SPA only sends what you need with each click, and your browser renders that information. This is different from a traditional page load where the server rerenders a full page with every click you make and sends it to your browser.

This piece-by-piece, client-side method makes load times much faster for users. It also lessens the amount of information a server has to send and makes the whole process a lot more cost-efficient — a win-win scenario for users and businesses.

It's obvious to see the benefits of a single page application. Utilizing a web application or website that interacts with the user by dynamically rewriting the current page, rather than loading entire new pages from the server, provides a much better user experience.

It avoids interruptions in a user's journey, which is vital for websites — especially in digital commerce. By cutting down on lag time between successive pages, it makes the site behave more like a desktop application, providing a more fluid and comfortable experience.

And this can make a huge impact. Because on most websites, there is a lot of repeating content.

Advantages

There are many benefits to SPA solutions on both the [customer experience](#) side and back-end design side of the equation. Improved application performance, consistency, reduced development time, and lower infrastructure costs not only help you offer a more pleasant experience to your users, they also help development teams operate more effectively.

SPAs are also good for making responsive designs for mobile, desktop, and tablet

A Single-time File Load Each For HTML, CSS, JS

Then, as you click around, the SPA sends back requests for data and markup. The server shoots back the raw materials needed, and your browser takes it and renders an updated UI, interchanging pieces without ever needing to refresh the full page. This quick interchangeability makes SPAs incredibly useful on pages that are highly navigated and use repeating templates.

No Extra Queries to Server

Because the server doesn't need to spend time and energy doing multiple renderings, SPAs lower the impact on your servers overall, meaning you can save money by using fewer servers for the same amount of traffic.

Fast and Responsive Front-end Building

your raw content and data might stay the same, but the way you want to display it may differ. By decoupling that back-end logic and data from how it's presented, you turn it into a "service," and developers can build many different front-end ways to show and use that service.

Enhanced User Experiences

Improved speed and responsiveness. Faster loading times are the result of the SPA only needing to load the information necessary based on the user's action rather than loading an entire page from scratch. Greater stability.

https://www.bloomreach.com/en/blog/2018/what-is-a-single-page-application.

Reusable Components in react?

a piece of UI that can be used in various parts of an application to build more than one UI instance.

In web development, creating reusable UI components is essential for building scalable and maintainable applications

It promotes efficiency by minimizing the code needed.

maintain consistency in logic and presentation.

Reusable components are ideal when similar functionality or UI patterns appear in multiple parts of your application. Instead of duplicating code, you can create a reusable component that can be easily shared and reused throughout your project

REACT INTRO

[React creates a virtual DOM in memory to update the browser's DOM. The virtual DOM will try to find the most efficient way to update the browser's DOM. Unlike browser DOM elements, React elements are simple objects and are cheap to create. React DOM takes care of updating the DOM to match the React elements.]

Instead of manipulating the browser's DOM directly, React creates a virtual DOM in memory, where it does all the necessary manipulating, before making the changes in the browser DOM.

React only changes what needs to be changed.

CDN - Content Delivery Network

```
<script src="https://unpkg.com/react@18/umd/react.development.js"crossorigin></script
<script src="https://unpkg.com/react-dom@18/umd/react-dom.development.js"crossorigin></script>
<script src="https://unpkg.com/@babel/standalone/babel.min.js"></script>
```

ReactDOM method to render the React element to the DOM

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

ES6 stands for ECMAScript 6.

- Classes
- Arrow Functions
- Variables (let, const, var)
- Array Methods like `.map()`
- Destructuring
- Modules
- Ternary Operator
- Spread Operator

single page applications (SPAs)
became more popular. An SPA is a web application paradigm that avoids refreshing a web page to display new content; it instead uses lightweight calls to the server to get some data or snippets and updates the web page.
The result looks quite nifty when compared to the
old way of reloading the page entirely.
AngularJS, a front-end framework based on the model-view-controller (MVC) design pattern, anchored this stack.

MongoDB, a very popular NoSQL database, was used for
persistent data storage.
Express, a web server built on Node.js,
React is an open-source JavaScript library maintained by Facebook that can be used for creating views rendered in HTML. Unlike AngularJS, React is not a framework. It is a library.
Node.js, a server-side JavaScript runtime environment,

React is not
a full-fledged MVC framework. It is a JavaScript library for building user interfaces, so in some sense it's the View part of the MVC.
use React to render a view (the V in MVC),structure.
React can compute the differences in
the virtual DOM very efficiently, and can apply only these changes to the actual DOM.

Component-Based
The fundamental building block of React is a component, which maintains its own state and renders itself.

In React, all you do is build components. Then, you put components together to make another component that depicts a complete view or page. A component encapsulates the state of data and the view, or how it is rendered.
No Templates
Many web application frameworks rely on templates to automate the task of creating repetitive HTML or DOM elements.
React uses a full-featured programming language to construct repetitive or conditional DOM elements.

There is an intermediate language to represent a virtual DOM, and that is JSX, which is very similar to HTML. It lets you create nested DOM elements in a familiar language rather than hand-construct them using JavaScript functions. Note that JSX is a representational markup like HTML.

Node.js Modules

Modules are like libraries. You can include the functionality of another JavaScript file by using the keyword require.

Node.js and npm

npm is the default package manager for Node.js. You can use npm to install third-party libraries (packages) and also manage dependencies between them.
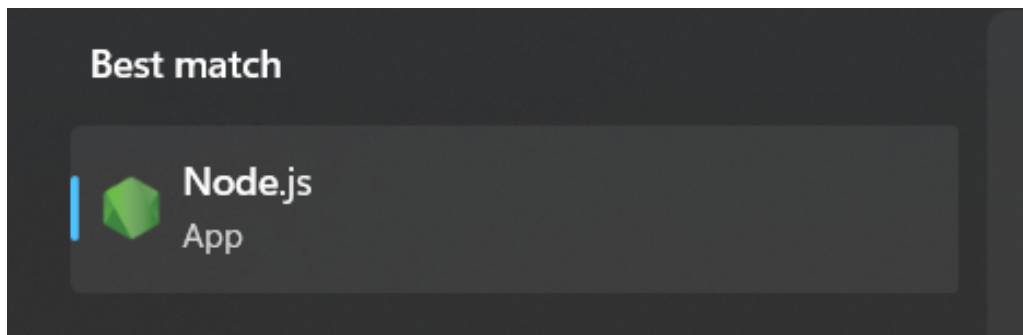

With react moving from one page to another happens seamlessly.
We can use the existing libraries **ex: for http we can use axios**
React also has ReactRouter to move from page to another
Node.js - provides javascript run time environment - helps to run javascript programs.

DOWNLOAD NODE.JS

Thunder Client is an alternative to POSTMAN - Create and Test API

- Npm install create-react-app

```
PS F:\React Course> npm install create-react-app
npm WARN deprecated tar@2.2.2: This version of tar is no longer
 supported, and will not receive security updates. Please upgra
de asap.

added 67 packages, and audited 68 packages in 25s
```

```
PS F:\React Course> npx create-reatc-app my-app
```

React is able to create components and combine together and allows us to have a smooth navigation between the pages.
Component Based architecture.