Introduction to React JS

What is ReactJS?

- 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.

A Brief History

- 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.

Components (1)

- A ReactJS application is made up of multiple components.

- Each component responsible for outputting a small, reusable piece of HTML code.

- These Components can be nested with other components to allow complex applications to be built of simple building blocks.
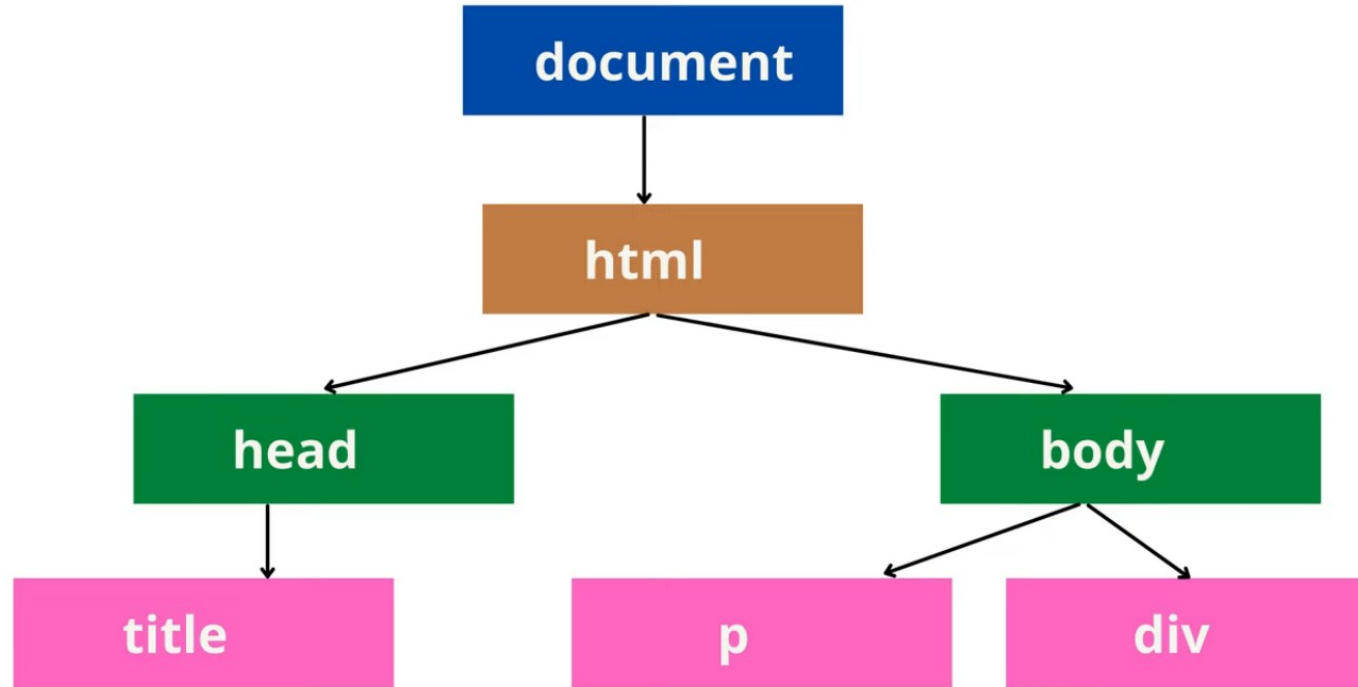
Components (2)

- 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.

DOM

- DOM stands for Document Object Model.

- It is the structural representation of all nodes in HTML document.

- DOM represents the UI of the application.

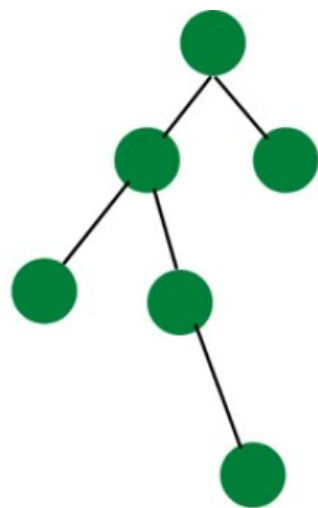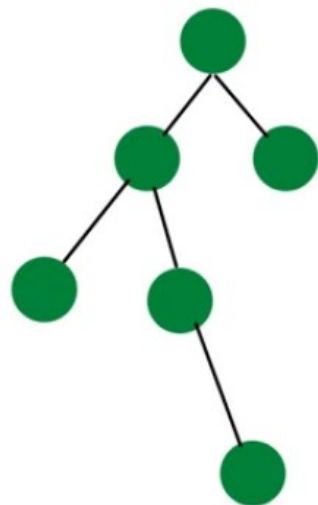- DOM manipulation is required to dynamically change the content of web page.

DOM

Virtual DOM

- Virtual DOM is a programming concept where "virtual" representation of a UI is kept in memory.

- It is synced with "Real DOM" by a library such as ReactDOM, this process is called reconciliation.
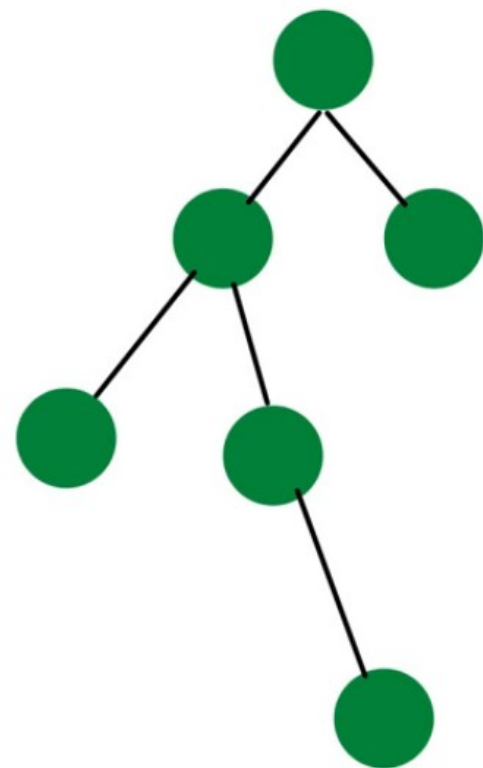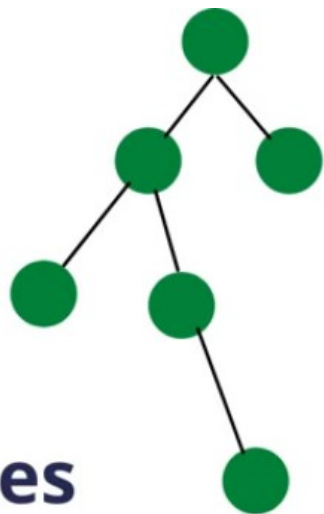
Updated Virtual DOM

compare

Virtual DOM
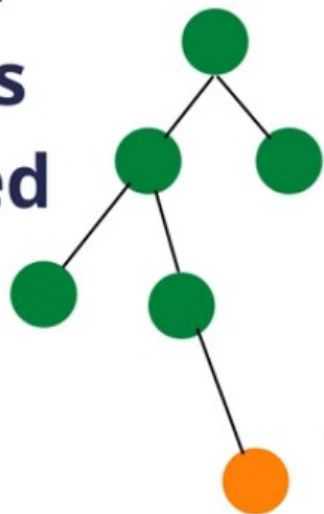
Real DOM

Updated Virtual DOM

it compares which DOM is changed

compare

Virtual DOM

Real DOM

Updated Virtual DOM

update those changes in virtual DOM
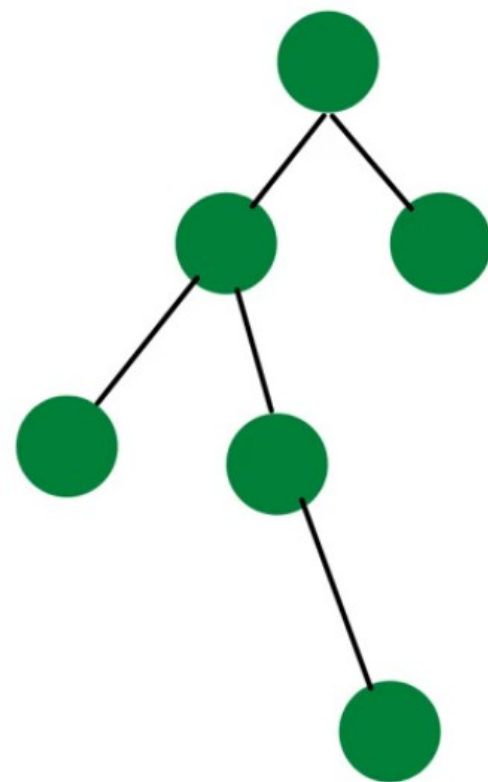
compare

Virtual DOM

Real DOM

Updated Virtual DOM

Virtual DOM will sync with Real DOM
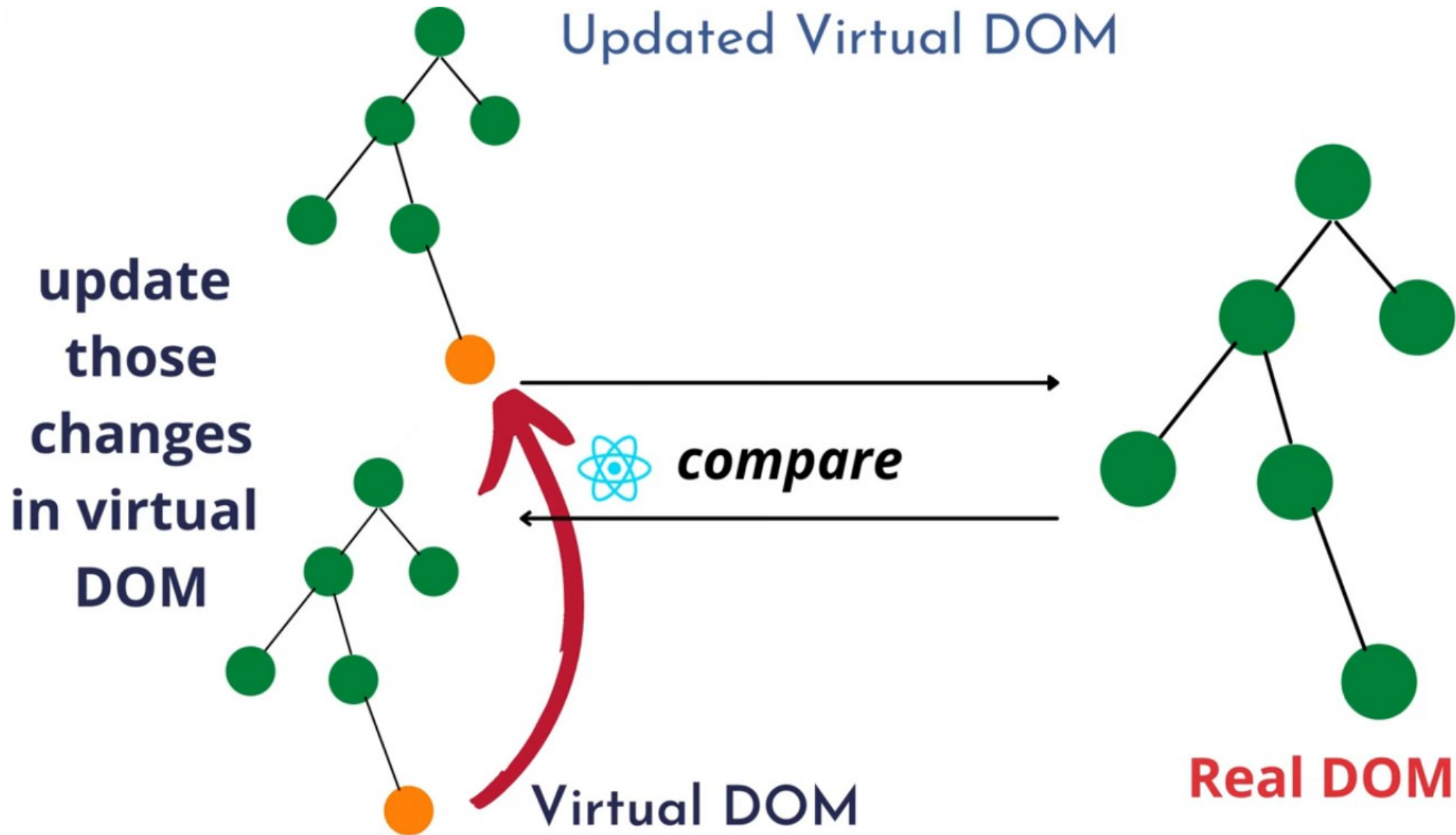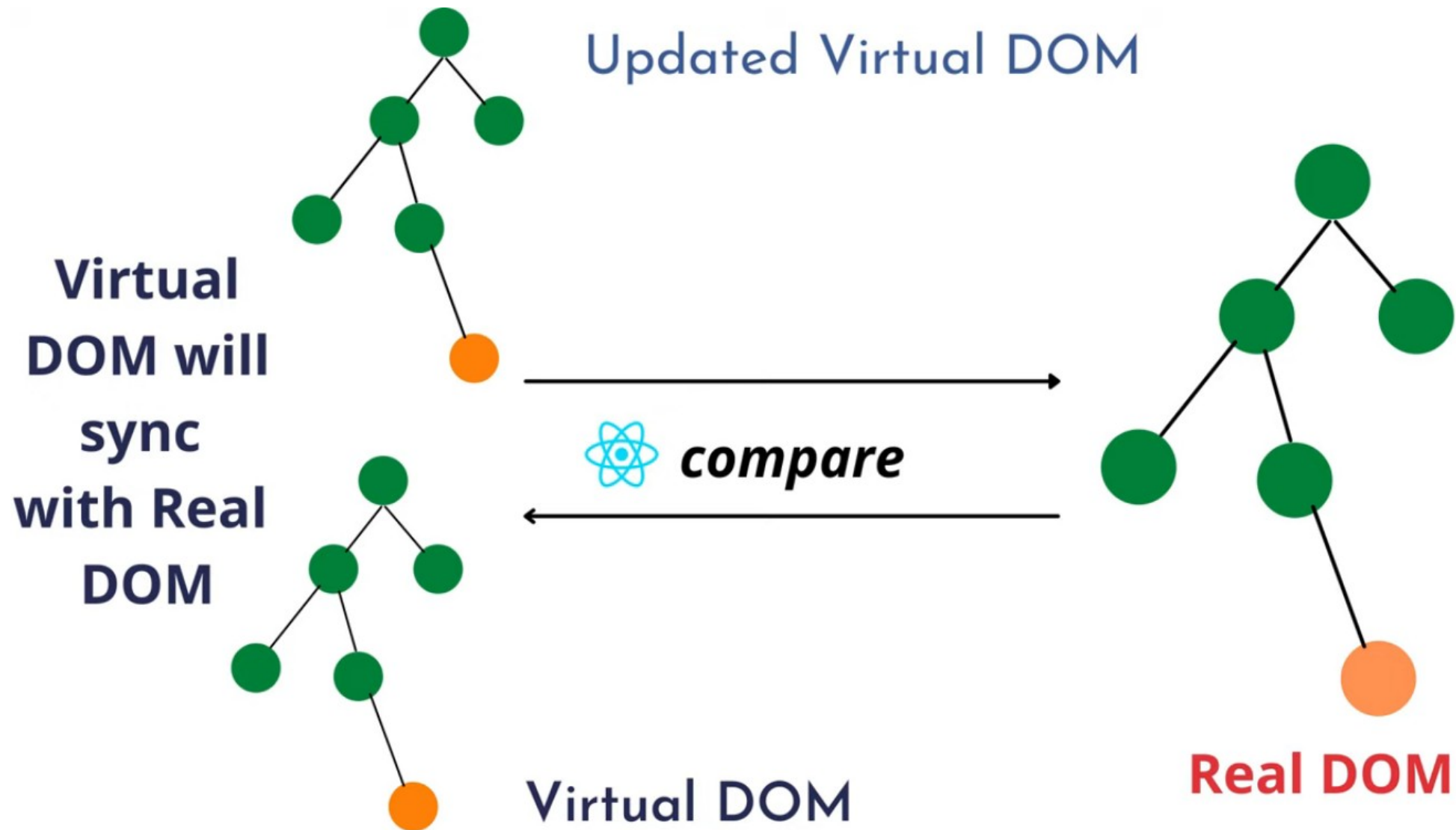
compare

Virtual DOM

Real DOM

Virtual DOM

- Frequent DOM manipulation is slow.

- Virtual DOM is a virtual representation of Real DOM in memory.

- Virtual DOM is synced with Real DOM using ReactDOM library which is called **reconciliation.**

- React compares the Virtual DOM and pre-updated virtual DOM and only marks the sub-tree of components that are updated. This process is caled **diffing.**

Why React?

- Improved Performance thanks to Virtual DOM

- Reusable Components

- Uni-directional Data Flow

- Easy learning curve

- Web and Mobile Apps

- Easy debugging tools

Libraries requirement for ReactJS

1. NodeJS and NPM

2. React and ReactDOM, Webpack, Babel

   OR

2. Create-react-app tool

Creating React Application

- **npx**
  - Syntax: npx create-react-app my-app
  - Note: npx comes with npm 5.2+ and higher.

OR

- **npm**
  - Syntax: npm init react-app my-app
  - Note: npm init <initializer> is available in npm 6+.

Creating React App with Vite

- Creating a new project using create-react-app takes a lot of time to install over 140 MB of dependencies.

- Vite is a lightweight tool that takes up 31 MB of dependencies, which will save time in starting a new project.

- Vite also uses the browser-native ES (ECMAScript) modules for linking to JavaScript files, which doesn't rebuild the entire bundle after each file change.

- These differences result in a faster experience when creating, updating, and building a React App with Vite.

- Syntax: npm create vite@latest