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[Asynchronous JavaScript]

- **SetTimeOut** (setTimeOut)

setTimeout function is used to delay the execution of pieace of code for specified amount of Time

Ex:

```
function greeting()
{
    console.log ("Hello");
}
setTimeout(greeting, 3000);   // function will be
                                 delayed for 3sec
```

In case of parameter
```
    setTimeout( fun name, Time, Parameter...);
```

- **Promise**

A promise in a javaScript is an object that repersent the eventual completion or failure of an asynchronous operation.

It is used for handling asynchronous operations such as making API calls or reading files, in more organized and readable way.

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States of Promise

Pending
The initial state. The promise is still being resolved or rejected.

Fulfilled
The Asynchrons fun has been completed sucessfully and the Promise is resolved. It returns a value

Rejected.
The Asynchronou operation has encountered an error and the promise is Rejecte It returns an erro

Main Functions of Promise

then ( )
This method is called when promise is fulfilled. It takes two optional callbacks, one for succes and one for failure. The sucess callback receives the resolved value and the failure receives rejected error.

Catch( )
This method is called when the promise is rejected. It takes a callback function that receives the error.

Ex.
```
fetch ('https://api.example.com/data').
    .then ( response => response.json())
    .then ( data => {
            console.log (data);
      })
     .catch( error => {
             console.log (error);
      });
```

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- **Ajax**

Ajax Stands for Asynchronous javaScript and XML
It is a technique used in web developement
to send and receive asynchronously from a
web server without having to reload the entire
page.

Ajax allows for updating parts of web pages
without refreshing the entire page. It is commonly
used to fetch data from a server, submit form
data and update dynamic content on webpage

- **JavaScript Array**

Its a way to store multiple values in a single
variable. Its like a list that can hold different
types of data such as numbers, string.

- **Promises in Detail**

Its a way to handle the results of an operation
that may take some time to complete.

A promise is always created with new Promise()
constructor. The constructor takes function as a parameter
which is called executor function.

The executor function takes two parameters which both
are functions resolve and reject.

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Resolve is called when operation is completed
Reject is called when operation is failed.

- **Asynchronous JavaScript**

Refers to the ability of JavaScript to perform tasks without having to wait for the tasks that are being executed, it allow multiple things to happen once.

Asynchronous code is commonly used when working with time-consuming tasks such as fetching data from API or reading files.

A common approch to handle Asynchronous code is to use callbacks, promises, or async Await

async/await :- It is a newer syntax that provides a cleaner way to write Asynchronous code. Async function always return a promise and await can be used to wait for the result of an asynchronous operation.

- **React VS Ajax**

React.js is a powerful open source JavaScript library for building large scale & complex web applications It provides component based architecture that lets you break your app into small, reusable components that can be easily shared and combined with other components.

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It handles the rendering of data in the UI and updates DOM only when neccessary, making it more efficient and faster.

Ajax on the other hand, is a web developement technique that allows you to update content on a web page without having to reload the entire page. It uses javaScript to send and receive data from a web server using asynchronous request.

React	Ajax
used for building web Applications ~~&~~ .	~~used~~ for communicating with web servers and updating the Content of a web page without reloading the entire pag

● **Diffing**
It is a technique used by libraries like React.js to efficiently update the user Interface. It involves comparing the previous state of UI to the current state and identifying the minimum no of changes needed to update UI.

How Diffing works.
1. A virtual repersentation of the previous UI state is created called virtual DOM.
2. When UI changes, a new virtual DOM is created to repersent new state
3. The two virtual DOMs are compared to identify the differences b/w them.

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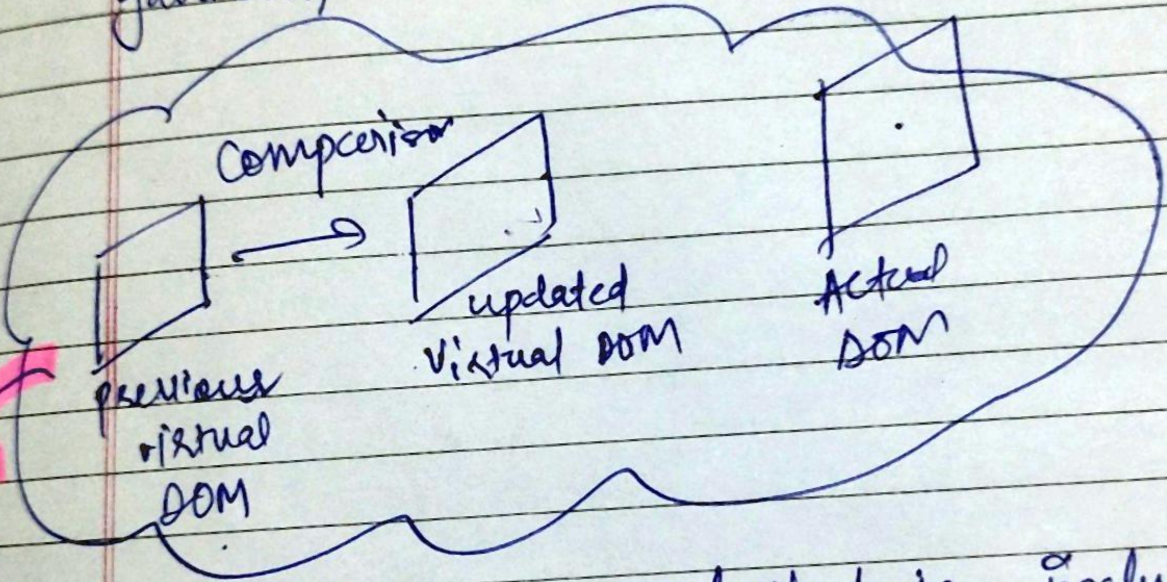
4. only the parts of the UI that have changed are updated in the actual DOM, rather than updating the ~~entire~~ UI.

By using Diffing React.js performs UI updates more efficiently
Results in faster updates

- Node.js
Node.js is an open Source, cross-platform runtime environment that allow developers to run JavaScript code outside the web browser.



Some of the feature of Node.js include :→

1. Asynchronous and event Driven :- It uses an event-driven, non-blocking I/O model that makes it lightweight and efficient.

2. Fast
3. Single threaded :- Node.js uses a single threaded model with event looping which enable it to handle large amount of incomming connections, making it highly Scalable