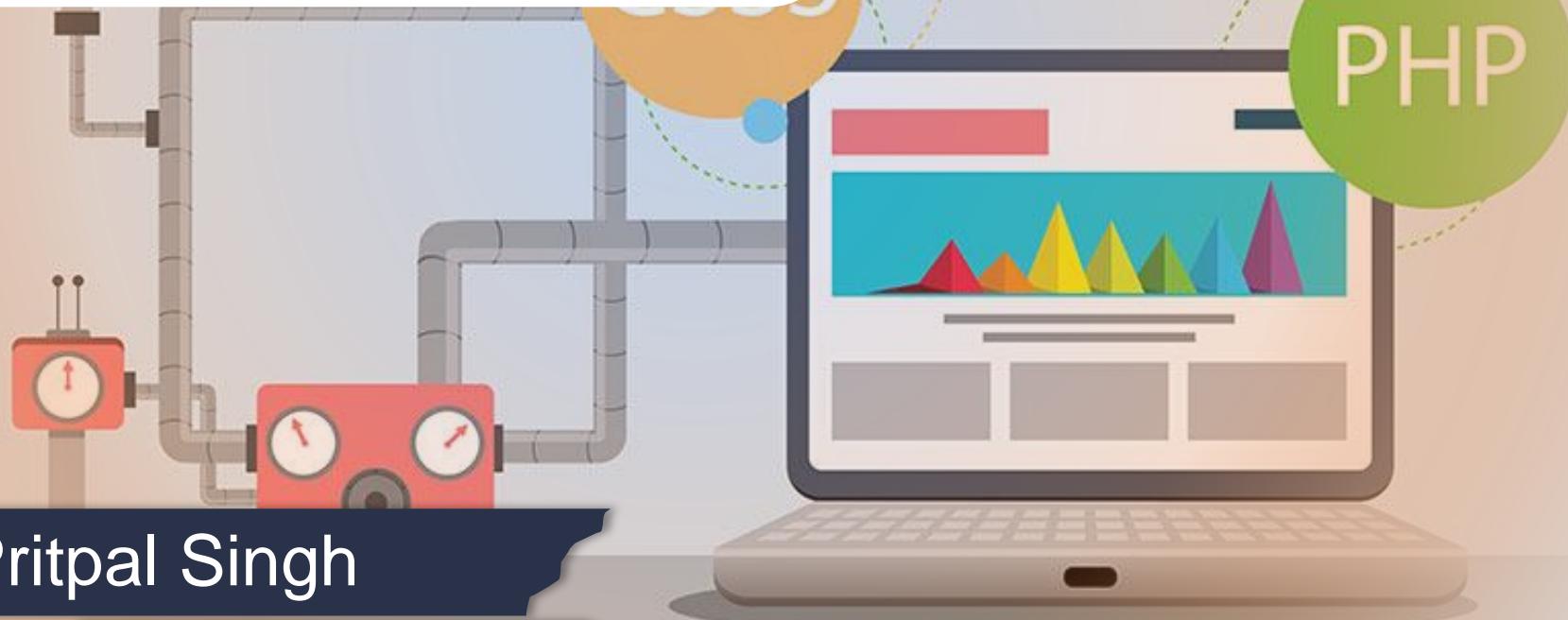


# ECAP472

## WEB TECHNOLOGIES



Dr. Pritpal Singh

Associate Professor

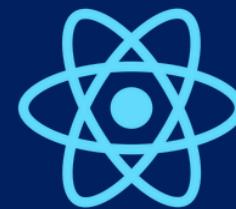
# Learning Outcomes



After this lecture, you will be able to

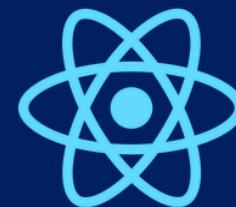
- Understand concept of React JavaScript library.
- Understand Installation of React JavaScript library.

# React



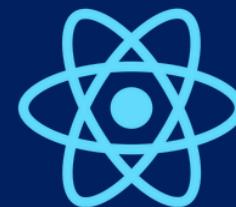
- React (also known as **React.js** or **ReactJS**) is a **free** and **open-source** front-end **JavaScript** library for building **user interfaces** based on **UI components**. It is maintained by **Meta** (formerly Facebook) and a community of individual developers and companies.

# React (JavaScript library)



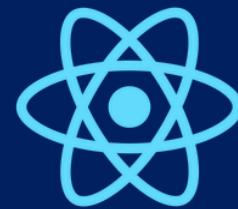
- React can be used as a base in the development of single-page or mobile applications. However, React is only concerned with state management and rendering that state to the DOM, so creating React applications usually requires the use of additional libraries for routing, as well as certain client-side functionality.

# Notable features



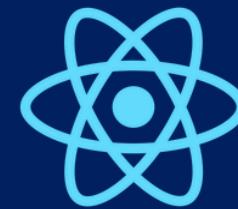
- Declarative-React adheres to the declarative programming paradigm. Developers design views for each state of an application, and React updates and renders components when data changes. This is in contrast with imperative programming

# Components



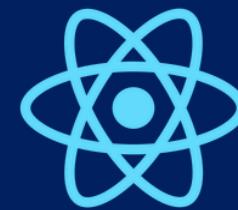
- React code is made of entities called components. These components are reusable and must be formed in the SRC folder following the Pascal Case as its naming conversion.
- Components can be rendered to a particular element in the DOM using the React DOM library

# Virtual DOM



- Another notable feature is the use of a virtual Document Object Model, or virtual DOM. React creates an in-memory data-structure cache, computes the resulting differences, and then updates the browser's displayed DOM efficiently. This process is called reconciliation. This allows the programmer to write code as if the entire page is rendered on each change, while the React libraries only render subcomponents that actually change.

# React installation



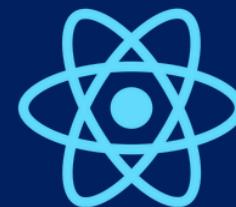
Install NodeJS and NPM.

Install Visual Studio Code.

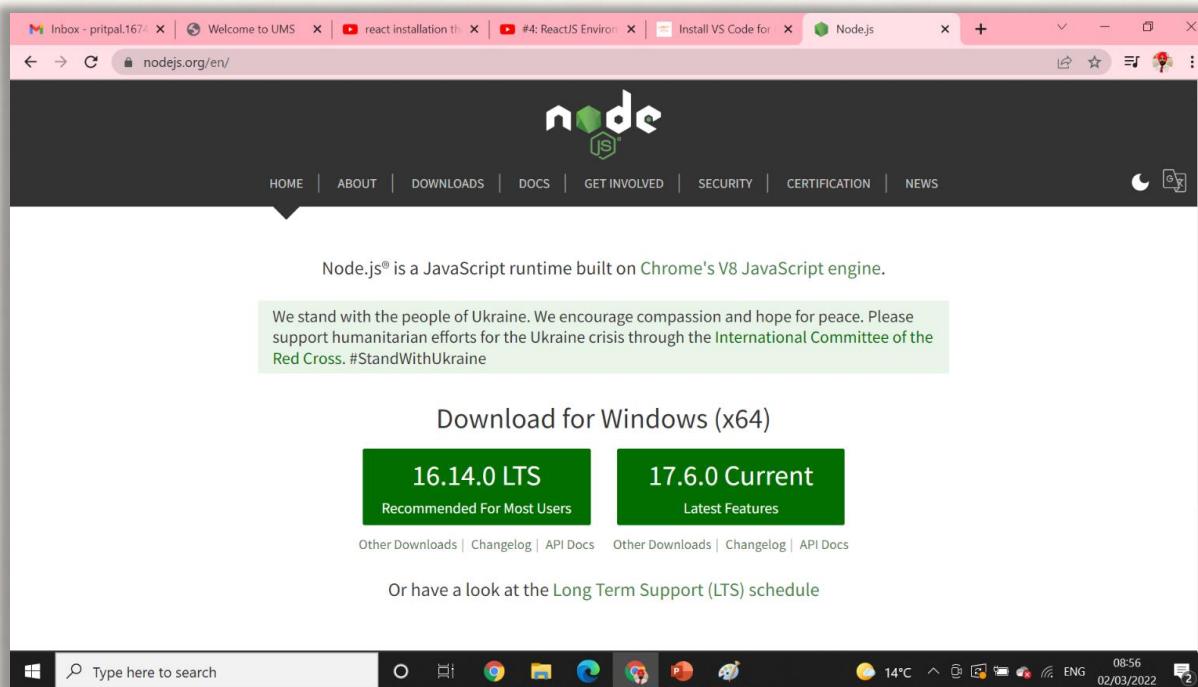
Install React from terminal .

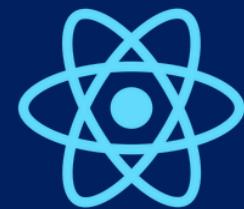
`npm install -g create-react-app`

# Install NodeJS and NPM.



- Go to <https://nodejs.org/en/>
- Download the latest version of NodeJS LTS with Administrator privileges.





# Open cmd \*cmd

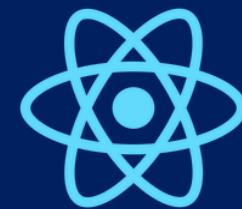
C:\ Command Prompt  
Microsoft Windows [Version 10.0.19044.1466]  
(c) Microsoft Corporation. All rights reserved.

C:\Users\Billa> -

An orange arrow points from the text "Open cmd \*cmd" at the top left towards the command prompt window.

Windows taskbar icons include: Search bar, Start button, File Explorer, Edge browser, Google Chrome, Microsoft Edge, Google Sheets, Microsoft Word, Microsoft Paint, Task View, 25°C weather, battery, network, system, ENG language, 03/03/2022 date, and a notification bubble showing '3'.

# To check version\* node -v



Command Prompt

Microsoft Windows [Version 10.0.19044.1466]  
(c) Microsoft Corporation. All rights reserved.

C:\Users\Billa>node -v  
v16.14.0

C:\Users\Billa>

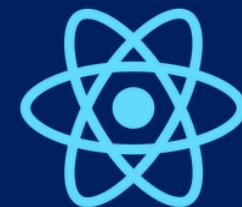


Type here to search



08:44  
03/03/2022

# Npm installation\* npm -v

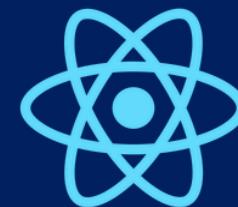


```
PS C:\Users\Billa> node -v  
v16.14.0  
  
PS C:\Users\Billa> npm -v  
8.3.1  
  
PS C:\Users\Billa>
```





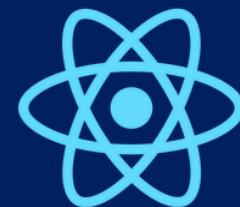
# Install visual studio code



The screenshot shows the Visual Studio Code interface with the following details:

- Top Bar:** File, Edit, Selection, View, Go, Run, Terminal, Help.
- Title Bar:** Get Started - awesomeapp - Visual Studio Code.
- Sidebar (Left):**
  - EXPLORER
  - OPEN EDITORS: Get Started
  - AWSOMEAPP
    - buffer-indexof
    - builtin-modules
    - bytes
    - call-bind
    - callsites
    - camel-case
    - camelcase
    - camelcase-css
    - caniuse-api
    - caniuse-lite
    - case-sensitive-paths-webpack-plugin
    - chalk
    - char-regex
    - charcodes
    - check-types
    - chokidar
    - chrome-trace-event
    - ci-info
    - cjs-module-lexer
    - clean-css
    - clean-stack
    - cliui
  - OUTLINE
  - NPM SCRIPTS
- Start Section:** New File..., Open File..., Open Folder...
- Recent Section:** You have no recent folders, open a folder to start.
- Walkthroughs:**
  - Get Started with VS Code**: Discover the best customizations to make VS Code yours.
  - Learn the Fundamentals**: Jump right into VS Code and get an overview of the must-have features.
  - Get started with Python development**: New
  - Boost your Productivity**
- Bottom Bar:** Show welcome page on startup, system tray icons (File Explorer, Taskbar, etc.), and status bar (14°C, ENG, 09:03, 02/03/2022).
- Bottom Search Bar:** Type here to search.

# Install react from terminal



**npm install -g create-react-app**

```
npm install create-react-app
Microsoft Windows [Version 10.0.19044.1466]
(c) Microsoft Corporation. All rights reserved.

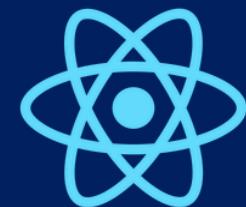
C:\Users\Billa>node -v
v16.14.0

C:\Users\Billa>npm -v
8.3.1

C:\Users\Billa>npm install -g create-react-app
[redacted] \ idealTree:npm: sill idealTree buildDeps
```

An orange arrow points from the text "idealTree" in the command line output to the "idealTree" icon in the taskbar.

# Installation



```
npm
Microsoft Windows [Version 10.0.18362.778]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\Vinod Thapa>npm install -g create-react-app
[██████████] / extract:create-react-app: verb lock using C:\Users\V

```



# React version\* create-react-app --version

A screenshot of a Windows Command Prompt window titled "cmd.exe" located at "C:\WINDOWS\system32\cmd.exe". The window shows the following text:

```
Microsoft Windows [Version 10.0.19044.1466]
(c) Microsoft Corporation. All rights reserved.

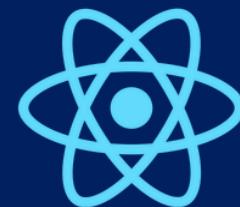
C:\Users\Billa>create-react-app --version
5.0.0

C:\Users\Billa>
```

An orange arrow points from the text "React version\*" in the slide's title down to the "5.0.0" output in the command prompt.

The taskbar at the bottom of the screen includes icons for File Explorer, Edge, Google Chrome, and PowerShell. The system tray shows the date and time as "03/03/2022 08:46".

# Creating directory\* mkdir



```
cmd C:\WINDOWS\system32\cmd.exe
Microsoft Windows [Version 10.0.19044.1466]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Billa>node -v
v16.14.0

C:\Users\Billa>npm -v
8.3.1

C:\Users\Billa>create -react -app -version
'create' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\Billa>create-react-app --version
5.0.0

C:\Users\Billa>mkdir reacttut_
```

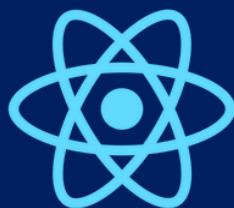


Type here to search



14°C ENG 02/03/2022 09:14

# Change working directory\* CD



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows [Version 10.0.19044.1466]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Billa>node -v
v16.14.0

C:\Users\Billa>npm -v
8.3.1

C:\Users\Billa>create -react -app -version
'create' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\Billa>create-react-app --version
5.0.0

C:\Users\Billa>cd reacttut
C:\Users\Billa\reacttut> -
```



# Create app inside directory \* create-react-app-awesomeapp

```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows [Version 10.0.19044.1466]
(c) Microsoft Corporation. All rights reserved.

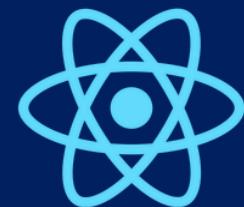
C:\Users\Billa>create-react-app --version
5.0.0

C:\Users\Billa>cd reacttut

C:\Users\Billa\reacttut>create-react-app-awesomeapp
```



# Installation going on



```
npm

D:\reacttut>create-react-app awesomeapp

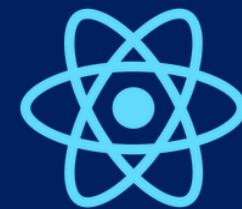
Creating a new React app in D:\reacttut\awesomeapp.

Installing packages. This might take a couple of minutes.
Installing react, react-dom, and react-scripts with cra-template...

[████.....] | fetchMetadata: sill resolveWithNewModule @ba
```

An orange arrow points from the top of the slide down towards the progress bar in the terminal window.

# Change directory \* CD



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows [Version 10.0.19044.1466]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Billa>node -v
v16.14.0

C:\Users\Billa>npm -v
8.3.1

C:\Users\Billa>create -react -app -version
'create' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\Billa>create-react-app --version
5.0.0

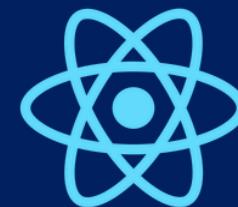
C:\Users\Billa>cd reacttut

C:\Users\Billa\reacttut> cd awesomeapp

C:\Users\Billa\reacttut\awesomeapp>
```



# Npm start\* npm start



```
Windows PowerShell
Microsoft Windows [Version 10.0.19044.1466]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Billa>cd reacttut
C:\Users\Billa\reacttut>cd awesomeapp
C:\Users\Billa\reacttut\awesomeapp>npm start

> awesomeapp@0.1.0 start
> react-scripts start
✓ Something is already running on port 3000.

Would you like to run the app on another port instead? ... yes
(node:18616) [DEP_WEBPACK_DEV_SERVER_ON_AFTER_SETUP_MIDDLEWARE] DeprecationWarning: 'onAfterSetupMiddleware' option is deprecated. Please use the 'setupMiddlewares' option.
(Use `node --trace-deprecation ...` to show where the warning was created)
(node:18616) [DEP_WEBPACK_DEV_SERVER_ON_BEFORE_SETUP_MIDDLEWARE] DeprecationWarning: 'onBeforeSetupMiddleware' option is deprecated. Please use the 'setupMiddlewares' option.
Starting the development server...
Compiled successfully!

You can now view awesomeapp in the browser.

Local:          http://localhost:3001
On Your Network: http://192.168.56.1:3001

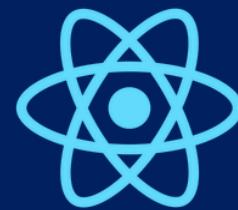
Note that the development build is not optimized.
To create a production build, use npm run build.

assets by path static/ 1.49 MiB
asset static/js/bundle.js 1.48 MiB [emitted] (name: main) 1 related asset
asset static/js/node_modules_web-vitals_dist_web-vitals_js.chunk.js 6.93 KiB [emitted] 1 related asset
asset static/media/logo.6ce24c58823cc2f8fd88fe9d219db6c6.svg 2.57 KiB [emitted] (auxiliary name: main)
asset index.html 1.67 KiB [emitted]
asset asset-manifest.json 546 bytes [emitted]
cached modules 1.36 MiB [cached] 106 modules
runtime modules 31.3 KiB 15 modules
./node_modules/webpack-dev-server/client/index.js?protocol=ws%3A&hostname=0.0.0.0&port=3001&pathname=%2Fws&logging=none&reconnect=10 6.59 KiB [built] [code generated]
webpack 5.69.1 compiled successfully in 1980 ms
```

A red arrow points from the text "Something is already running on port 3000." to the "DeprecationWarning" message.

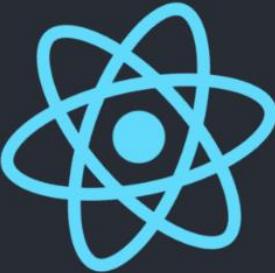
The Windows taskbar at the bottom of the screen shows several pinned icons: File Explorer, Edge, Google Chrome, File Explorer again, and Visual Studio Code. The system tray on the right displays the date (02/03/2022), time (09:31), battery level (16°C), and network status.

# Local host



React App    X    +

localhost:3001



Edit `src/App.js` and save to reload.

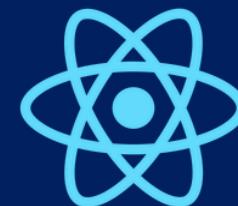
[Learn React](#)

Type here to search

O    ⌂    Chrome    File    Edge    Google Sheets    VS Code    Taskbar

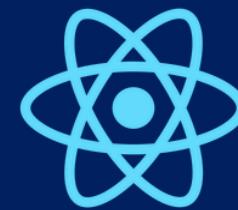
16°C    ENG    02/03/2022    09:32

# What is npm for?



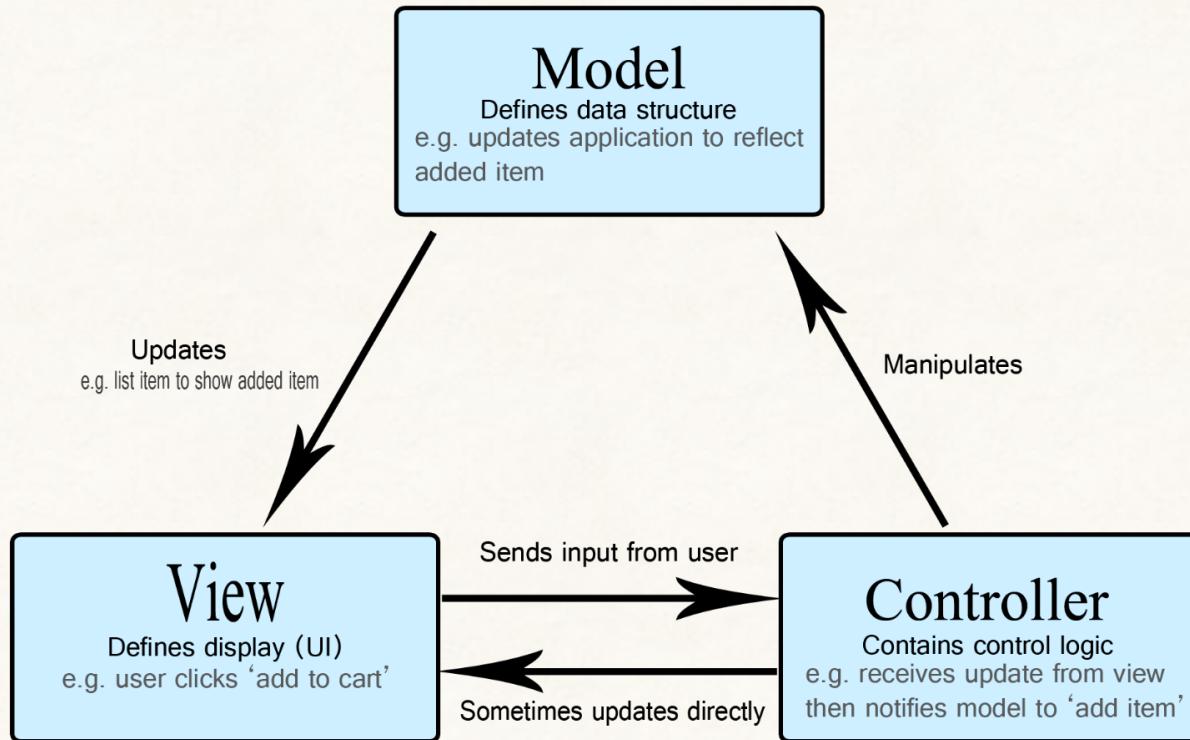
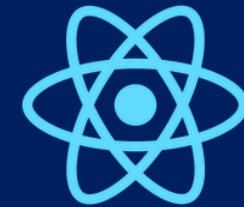
npm is the package manager for the Node JavaScript platform. It puts modules in place so that node can find them, and manages dependency conflicts intelligently. It is extremely configurable to support a wide variety of use cases. Most commonly, it is used to publish, discover, install, and develop node programs.

# MVC (Model-View-Controller)

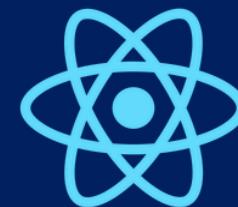


- MVC (Model-View-Controller) is a pattern in software design commonly used to implement user interfaces, data, and controlling logic. It emphasizes a separation between the software's business logic and display. This "separation of concerns" provides for a better division of labor and improved maintenance.

# MVC (Model-View-Controller)

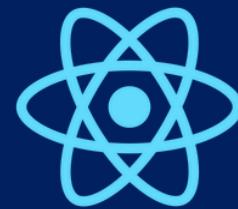


# What is Gitignore?



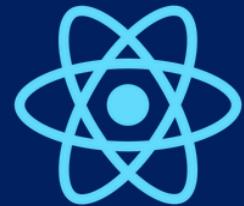
- The .gitignore file tells Git which files to ignore when committing your project to the GitHub repository. .gitignore is located in the root directory of your repo. / will ignore directories with the name.
- Ignored files are usually build artifacts and machine generated files that can be derived from your repository source or should otherwise not be committed

# package.json file



- The package.json file is the heart of any Node project. It records important metadata about a project which is required before publishing to NPM, and also defines functional attributes of a project that npm uses to install dependencies, run scripts, and identify the entry point to our package.

# What is a package lock json file?



- In version 5, npm introduced the package-lock.json file. This file is used to keep track of the exact version of every package that is installed so that a product is 100% reproducible in the same way even if packages are updated by their maintainers. This solves a very specific problem that package.

That's all for  
now...