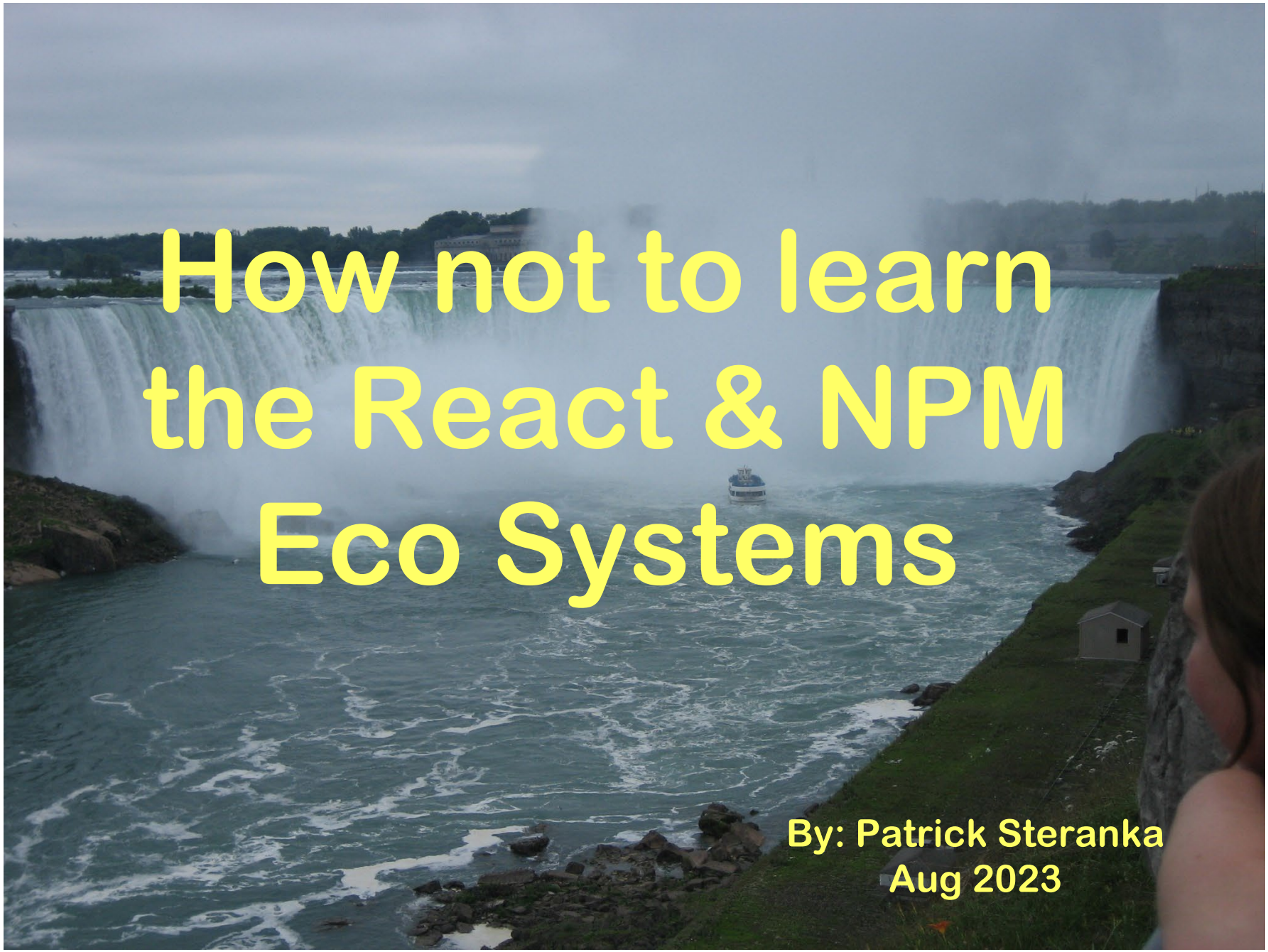
How not to learn
the React & NPM
Eco Systems
By: Patrick Steranka
Aug 2023

Goal of Presentation

- Help others avoid pitfalls I ran into
- Provide recommendations on how to learn Javascript and React
- Share my knowledge and experiences and give back to CharmCityJS

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Agenda

- OLD: How I used to learn technologies
  - Big Picture
  - Learn technologies from bottom up
  - Read the specs, read books, take training
  - Know how it all works
- Review how I used to learn
  - What worked and what didn't
  - How my world view changed
- Review some examples of what I did
  - What failed, and suggest recommendations
- NEW: How I now learn technologies

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How I used to learn technologies

- Understand Big Picture
- Learn technologies from the bottom up
- Read the specs, books, take training
- Get tools and learn the tools
- Attend meetups & talk with other developers
- For each concept
  - Create small stand-alone sample programs to illustrate a specific concept
- Create diagrams and documents to capture what I've learned

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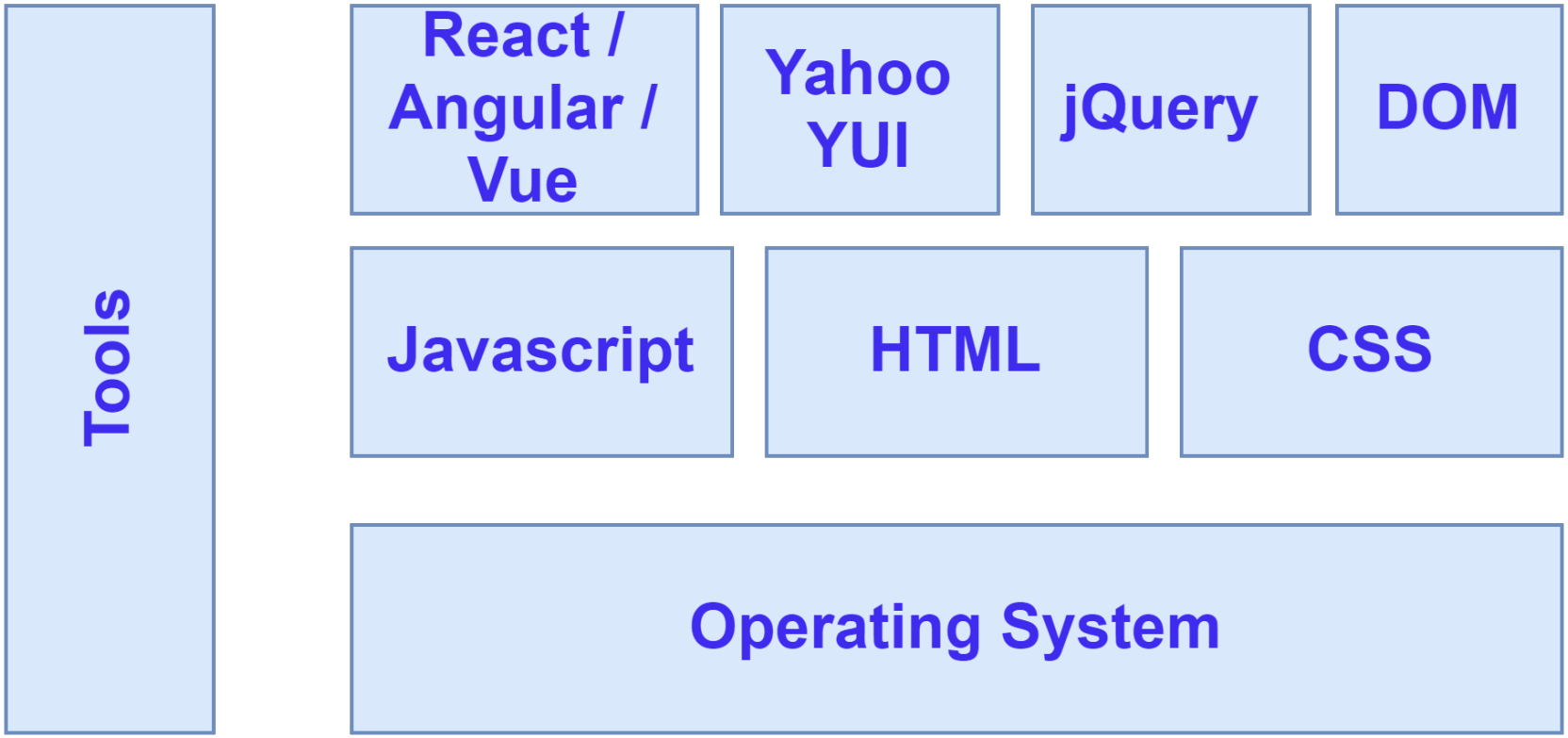
Big Picture



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Learning technologies from the bottom up

- Specs
  - Javascript ECMA-262 (110 pages), to 2023 (14th edition) (840 pages)
  - HTML5 [Web]
  - CSS3 Specs - MDN
  - React and other technologies have no specs
    - Old website: legacy.reactjs.org, New website: react.dev
- Books
  - JavaScript: The Definitive Guide, 7th Edition
  - HTML & CSS: Design and Build Websites
  - CSS: The definitive Guide
  - JavaScript: The good parts – Not a beginners book
  - Many others...
- Training / Podcasts / other
  - UDEMY

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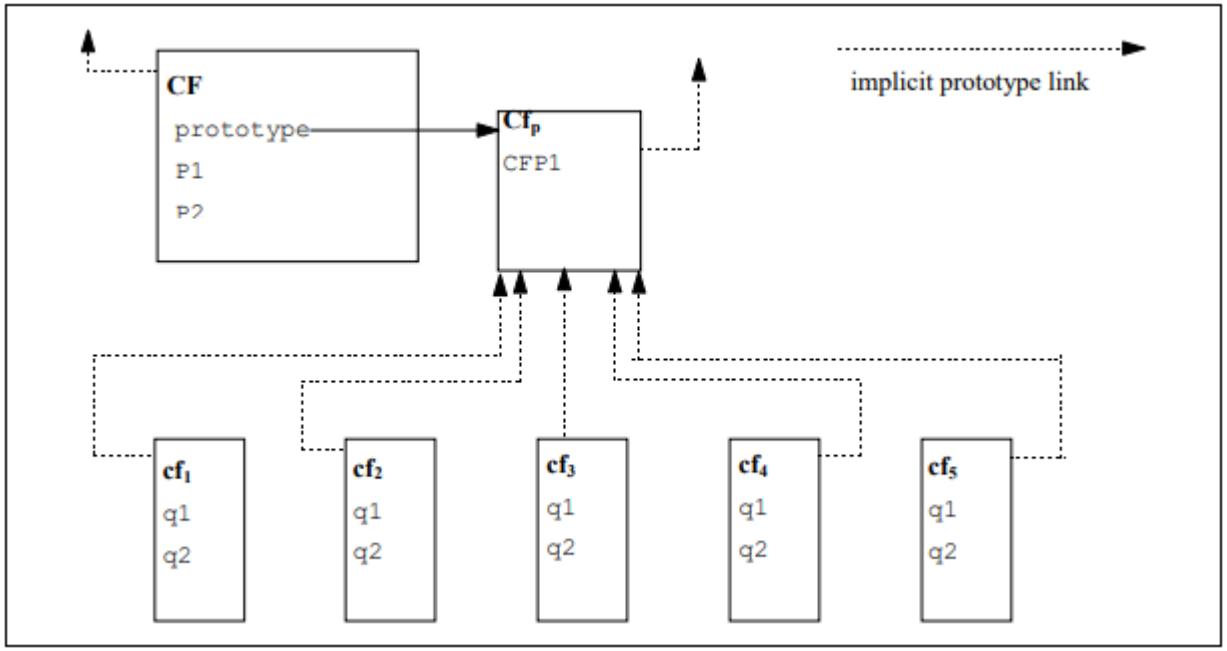
ECMA-262 Object Model

- Javascript Object
  - Custructors, Prototypes, inheritance

ECMAScript does not contain proper classes such as those in C++, Smalltalk, or Java, but rather, supports constructors which create objects by executing code that allocates storage for the objects and initializes all or part of them by assigning initial values to their properties.



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What not to do

Learn technologies from the bottom up

- **Specs – Javascript, HTML, CSS**
  - **Waste of time for beginers. Many better (easier) references exist.**
    - **HTML standard its over 1400 pages!**
    - **CSS is a collection of dozens of standards. Forget it! Read a book on how to use CSS and learn the 20% of the 20 standards you want.**
      - **CSS Introduction dropped and replaced by CSS Snapshots (2007, 2010, 2015, 2017, 2018, 2020,21,22,23**
    - **Javascript spec is now 840 pages has undergone numerous changes in the past 15 years**
  - **So much to learn and so little time...**
    - **The web has been around 20-30 years now, there is a lot of cruft that doesn't need to be learned!**
    - **Focus on the 80% of HTML you need to learn**
    - **Learn CSS Box model**
- **Books & Video**
  - **Don't read/watch old React, Javascript, HTML, CSS books they will teach outdated and/or deprecated concepts**

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What you should do

Learn technologies from the bottom up

- Javascript
  - Learn about null, nothing, truthy-ness, and shallow and deep equality
  - Learn about looping who knew it could be so complicated
  - Learn how closures work and pitfalls (memory),
  - Learn about Javascript OO (prototype inheritance) and the meaning of "this"
  - Learn about promises, await, and how event dispatching works
- Learn HTML basics (MDN is great resource)
- CSS - Learn CSS Box model
  - Grid, or Flex or both
  - How adjacent space is joined (affects spacing)
- Books are good.
- Web articles are OK.
- Video is often best due to visual nature
  - I like UDEMY & YouTube
- Use some AI search tool https://claude.ai/chats

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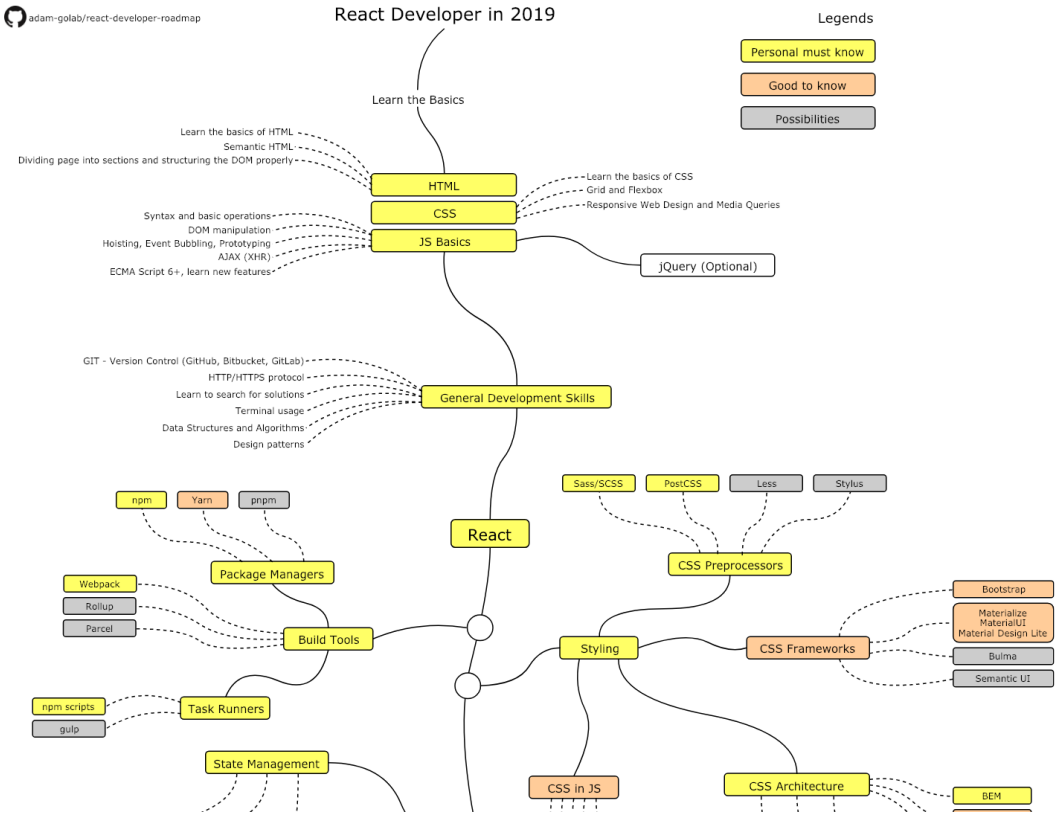
New Big Picture

- **React Developer Roadmap**
  - https://github.com/adam-golab/react-developer-roadmap
  - **Lots more to learn than I realized**



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What not to do

Learn technologies from the bottom up

- Don’t try to learn it all (like I did)
- My prior strategy for learning about technology from the ground up is no longer viable.
  - Too much to learn
  - Implementations change too frequently to benefit from deep study
    - React Render deep dive

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What you should do

Learn technologies from the bottom up

- Pick one or two technologies to learn and try to use them everyday.
- Repetition is the key to learning!
- Try to find some podcast, article, or video to watch every day to re-inforce a new technology

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Tools and Recommendations

- Browser - pick one and get good at it
- git, npm, node, chrome dev tools – Must learn these tools
- Build Tools – tsc, webpack, rollup, parcel
- IDE - Webstorm, Vscode, Sublime4
  - pick one and get good at it

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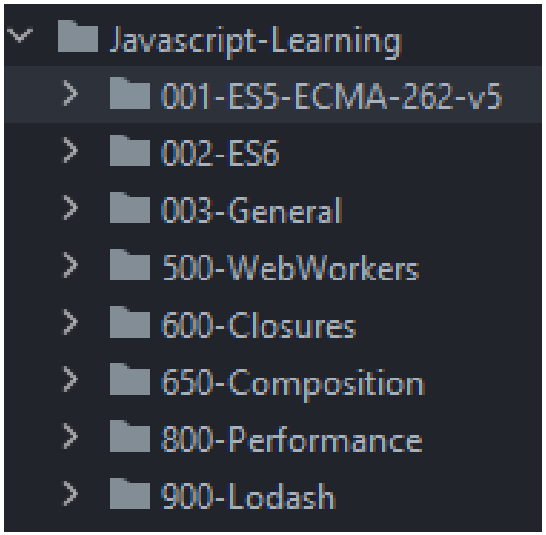
For each concept … create program

- Javascript, React
  - I created a stand alone app



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How are modules initialized?

(Q) If a module is included by multiple other modules, is the module only loaded once?

(A) No. I didn't think so but wrote a test program to prove it.

To run this program run

```
webpack
node bundle.js
```

NOTE: The output is

```
file1 is stand alone
file3 is stand alone
file2-uses-file3 is being loaded now
file4-uses-file3 is being loaded now
Inside main
```

Because no line is printed more than once, this proves that initialization/loading of a file only occurs one time regardless of how many times it is *included*.

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What not to do

Creating stand alone test programs

- Don't try to use NodeJS to test javascript
- Don't try to write javascript that will run in the browser and in NodeJS
- Don't try and figure out how to change require() (in NodeJS) to import statements (in JS).
- I did and the result was largely a waste of time googling for things that no one else would ever do! OK some others did these things.
- Realize that the solutions used for the browser don't always work in NodeJS and visa-versa.
  - Some utility libraries are exceptions (like lodash)
  - The way application building works between NodeJS and Javascript for the Browser is completely different.
  - The way threading (or not!) works in NodeJS is different from the browser.

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What You should do
Creating stand alone test programs

- Use browser sandboxes to test out concepts
  - CodeSandbox.io
  - CodePen.io
  - BabelJS.io
  - NodeJS [CodeSandbox.io]
- You can use

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New Big Picture

Tools
- Build Tools
- Package Management
- Dependency Management Tools
- CSS Transpilers
- Unit Testing (Jest, Mocha, etc)

React / Angular / Vue | Yahoo YUI | jQuery | DOM

Utility Libraries
lodash, moment, classnames, etc

Javascript | HTML | CSS | NodeJS

Operating System

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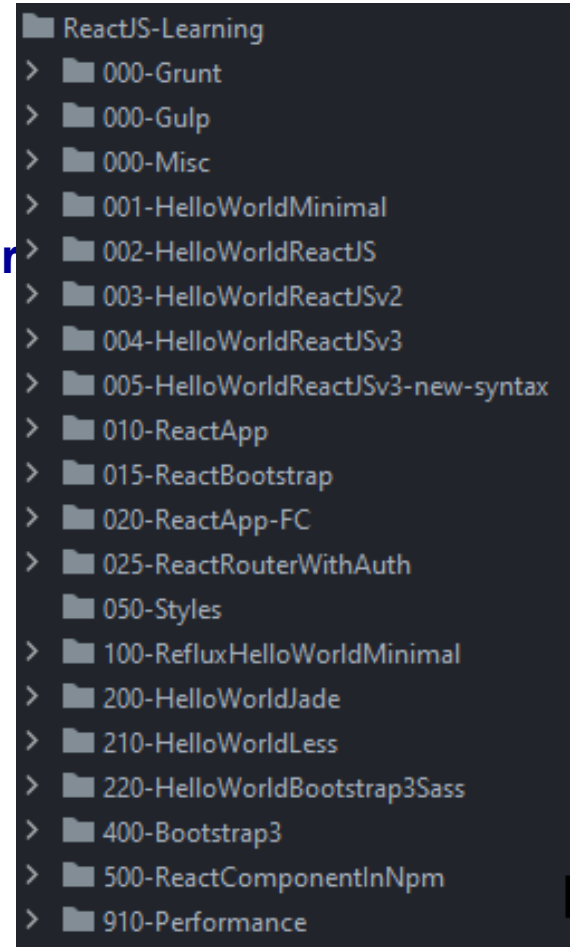
Learning React

- I created many examples
  - Examples with Classes
  - Examples with Functional Components
  - Sample components to use as cookie cutter
- Some examples used CDN
- Some used grunt to transpile/bundle
- Some used create-react-app



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What you should do

Learning React

- Pick a version of React and try to stick with it.
- Document the version of React, Node and NPM you are using in your README.md so that if someone clones the code, they know what version of node/npm should work!
- Commit your package-lock.json files!
- When watching tutorials, avoid tutorials where the author doesn't include the versions of the packages installed!
  - When you watch it 6 months later, your code might not compile/build/install
- Find a version of create-react-app you like and use the same one for all of your sample apps. (I wish I did this!)
  - Or spend time learning something you didn't plan on learning when what worked on one project no longer works the same way in this project.
- Learn client side react before trying to learn server side!

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What I did wrong

Learning React

- I thought React was javascript.
- I thought React was like jQuery but with a buffer to update DOM off screen
- I thought I could make changes to the DOM
  - I thought I could change arrays and data would update on the screen
  - I changed this.state without realizing that should never be done.
- I tried to take existing code and tweak it to work in React
- I didn't realize it but at the time I learned React it was on the bleeding edge.
  - No package-lock.json
  - No way of easily managing dependencies
  - Every 6 months my examples stopped working
- When packages changed I tried to keep up with them instead of staying put.

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Learning webpack

- **React eject**

  npx createreactapp mywebpacktest

  cd mywebpacktest

  npm start

  npmrun eject

- **Study webpack build scripts**
  - **My logic: Since create-react-app is giving a sample react app, then studying how it's build system works with webpack will help me learn webpack**
  - **BUZZ! AAAHHH! Nope**
    - **Danger Will Robinson**
    - **Pain, run, run**

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What not to do
Learning WebPack

- Don't try and do this! It's painful
- The scripts are written using advanced techniques which may be difficult for a beginning Javascript/React developer to understand. And there's no one who is going to explain them!
- Webpack does an awful lot of things, many of which are way beyond what you need to do in order to configure webpack and understand how it works
  - bundling, hot module reload, source maps, and much more)
- The version of webpack has changed over the years with create-react-app.

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What You should do
Learning WebPack

- Search for one of the many good webpack tutorials
- Webpack does an awful lot of things, many of which are way beyond what you need to do in order to configure webpack and understand how it works
  - Something I put together
  - Google search for webpack tutorial
  - https://www.youtube.com/watch?v=MpGLUVbqoYQ (Not yet verified)
  - My answer on StackOverflow to answer the question:
    Invalid configuration object. Webpack has been initialised using a configuration object that does not match the API schema

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Other things I've done

- Tried understanding how promises work in browser and NodeJS and trying to figure out why things were working slightly differently.
- Trying to understand why Chrome DevTools wasn't allowing me to set breakpoints in React Code that was (in theory) compiled for development mode.
  - I learned all about sourcemaps and why this happens...
  - See Debug Webpack App Browser

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How I now learn technologies

- Understand Big Picture
- Get a task
  - Learn what you need to get the task done
  - Ask other developers the tools they use
  - Learn LINGO so you can search for answers
  - Find an AI search tool to use when google and stackoverflow.com don't have the answers
- Repeat performing tasks
  - Create mental models of how things work and validate them with senior devs

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How I now learn technologies (2)

- For technologies I do the following
  - Buy and take a $10 UDEMY course
  - Find YouTube video presentations
  - Create bookmark of youtube videos I can listen to while working out
  - Use online website instead of trying to create stand alone tasks

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Questions?

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Summary of Changes

Version / Date	Description
V1.0 2023-07-30	Initial version for CharmCityJS August 2023 meeting
V1.1 2023-08-02	Tweeks from reviewing

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