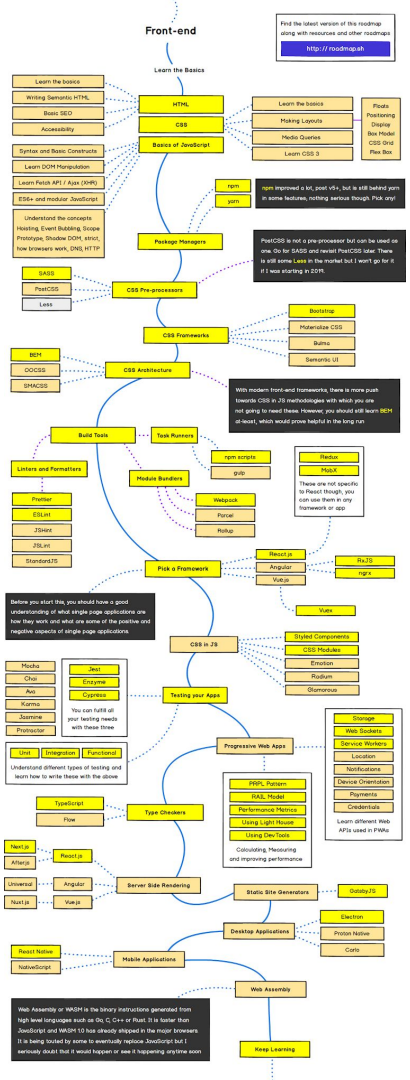
Web Application Development

2019

Where To Go From Here

https://roadmap.sh

Frontend


Front-end
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Writing Semantic HTML
Basic SEO
Accessibility
HTML
CSS
Basics of JavaScript
Learn the basics
Making Layouts
Media Queries
Learn CSS 3
Floats
Positioning
Display
Box Model
CSS Grid
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Syntax and Basic Constructs
Learn DOM Manipulation
Learn Fetch API / Ajax (XHR)
ES6+ and modular JavaScript
Understand the concepts
Hoisting, Event Bubbling, Scope
Prototype, Shadow DOM, strict,
how browsers work, DNS, HTTP
npm
yarn
npm improved a lot, post v5+, but is still behind yarn in some features, nothing serious though. Pick any!
Package Managers
PostCSS is not a pre-processor but can be used as one. Do for SASS and revisit PostCSS later. There is still some Less in the market but I won't go for it if I was starting in 2019.
SASS
PostCSS
Less
CSS Pre-processors
CSS Frameworks
Bootstrap
Materialize CSS
Bulma
Semantic UI
BEM
OOCSS
SMACSS
CSS Architecture
With modern front-end frameworks, there is more push towards CSS in JS methodologies with which you are not going to need these. However, you should still learn BEM at-least, which would prove helpful in the long run
Build Tools
Task Runners
npm scripts
gulp
Linters and Formatters
Module Bundlers
Prettier
ESLint
JSHint
JSLint
StandardJS
Webpack
Parcel
Rollup
Redux
MobX
These are not specific to React though, you can use them in any framework or app
Pick a Framework
React.js
Angular
Vue.js
RxJS
ngrx
Vuex
Before you start this, you should have a good understanding of what single page applications are how they work and what are some of the positive and negative aspects of single page applications
CSS in JS
Styled Components
CSS Modules
Emotion
Radium
Glamorous
Mocha
Chai
Ava
Karma
Jasmine
Protractor
Jest
Enzyme
Cypress
You can fulfill all your testing needs with these three
Testing your Apps
Unit
Integration
Functional
Understand different types of testing and learn how to write these with the above
Progressive Web Apps
Storage
Web Sockets
Service Workers
Location
Notifications
Device Orientation
Payments
Credentials
Learn different Web APIs used in PWAs
PRPL Pattern
RAIL Model
Performance Metrics
Using Light House
Using DevTools
Calculating, Measuring and improving performance
TypeScript
Flow
Type Checkers
Next.js
After.js
React.js
Universal
Nuxt.js
Angular
Vue.js
Server Side Rendering
Static Site Generators
GatsbyJS
Desktop Applications
Electron
Proton Native
Carlo
React Native
NativeScript
Mobile Applications
Web Assembly
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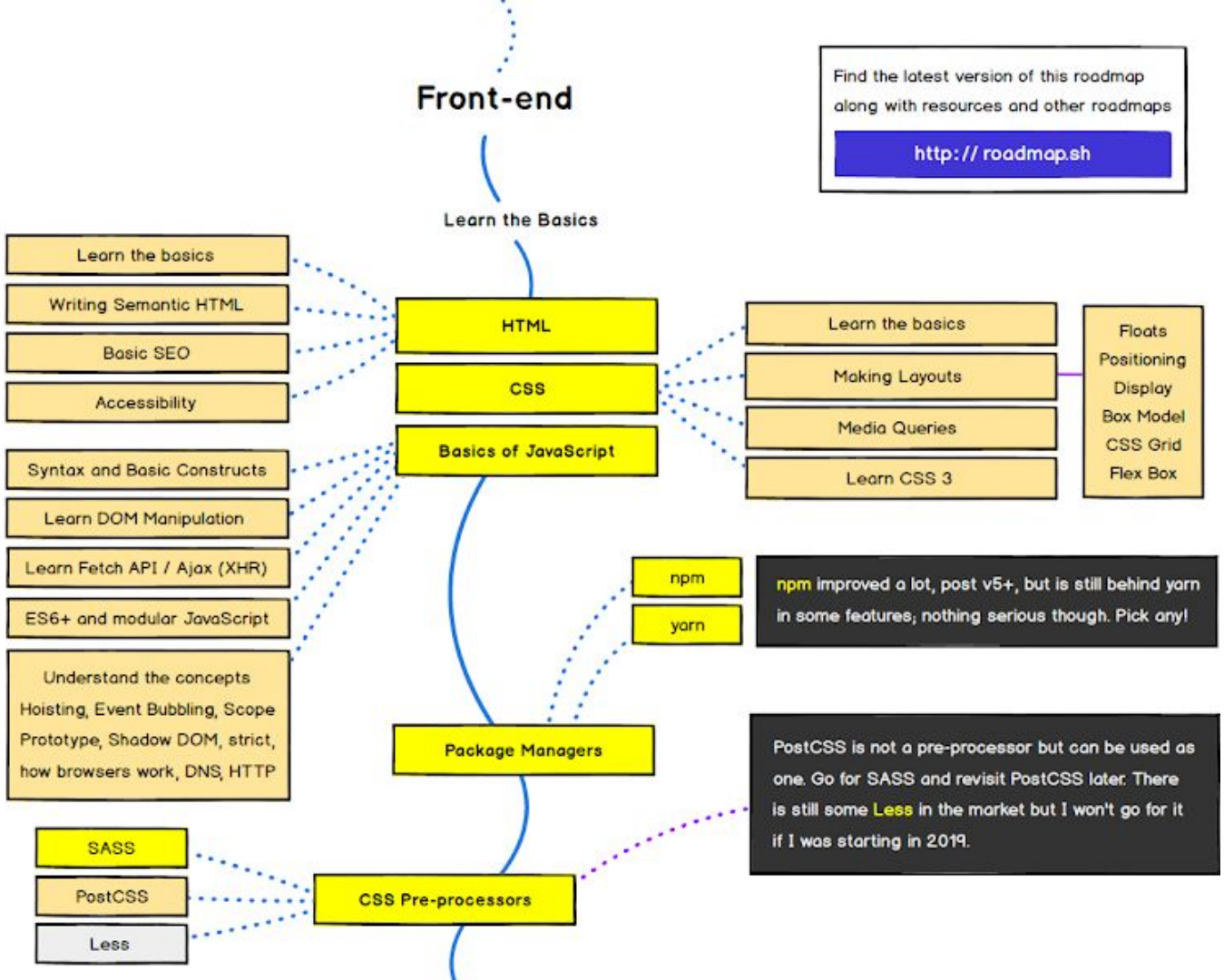
Keep Learning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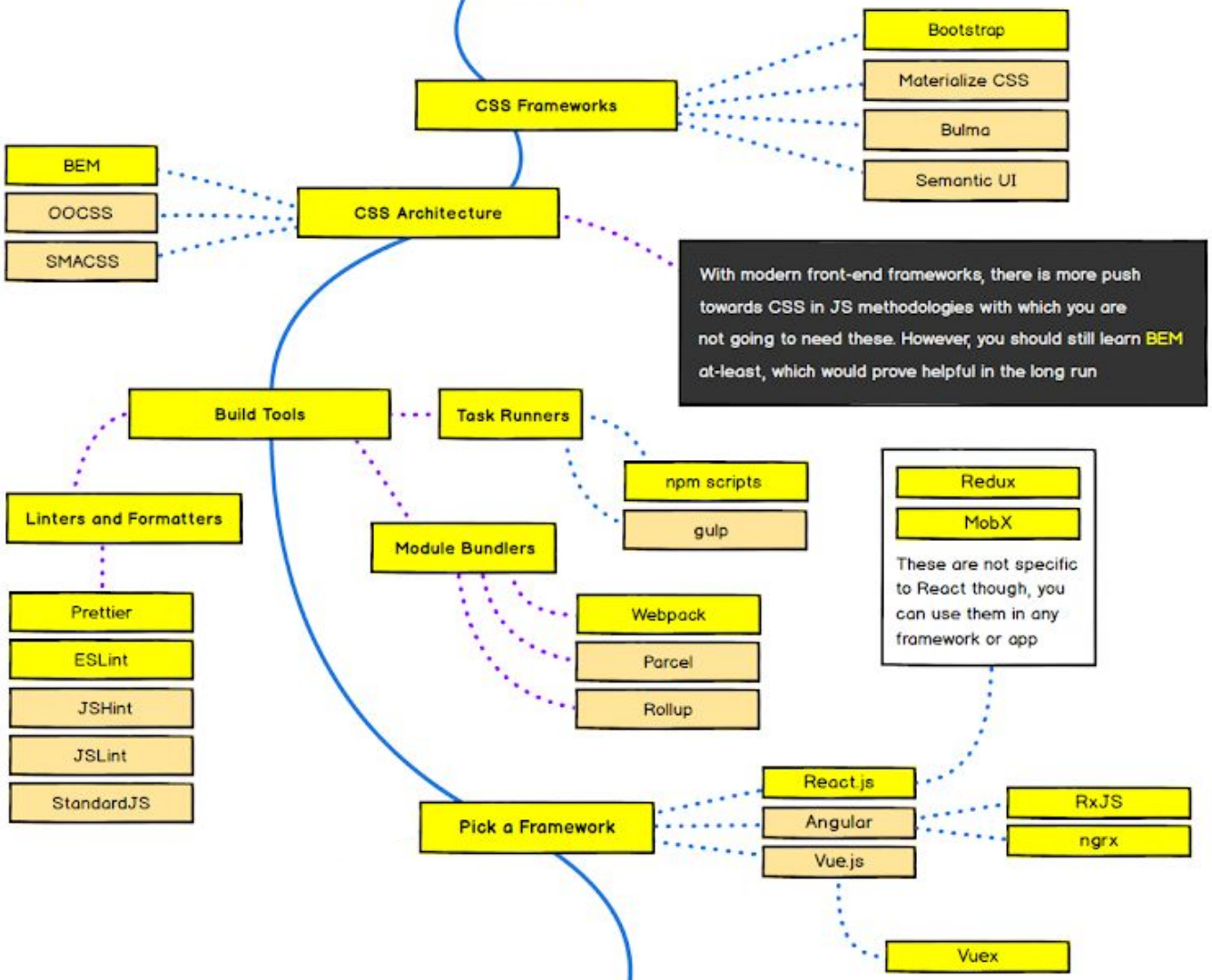
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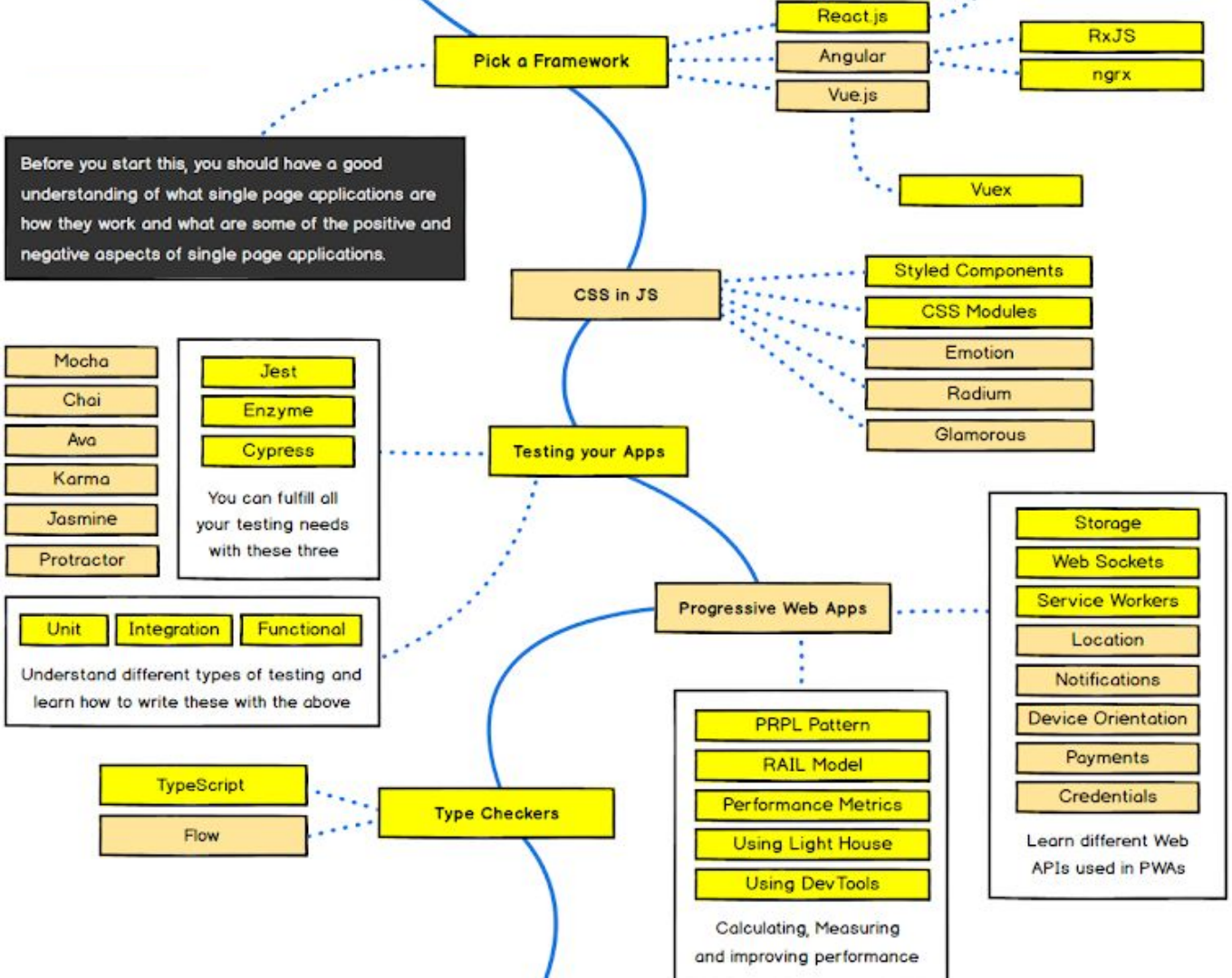
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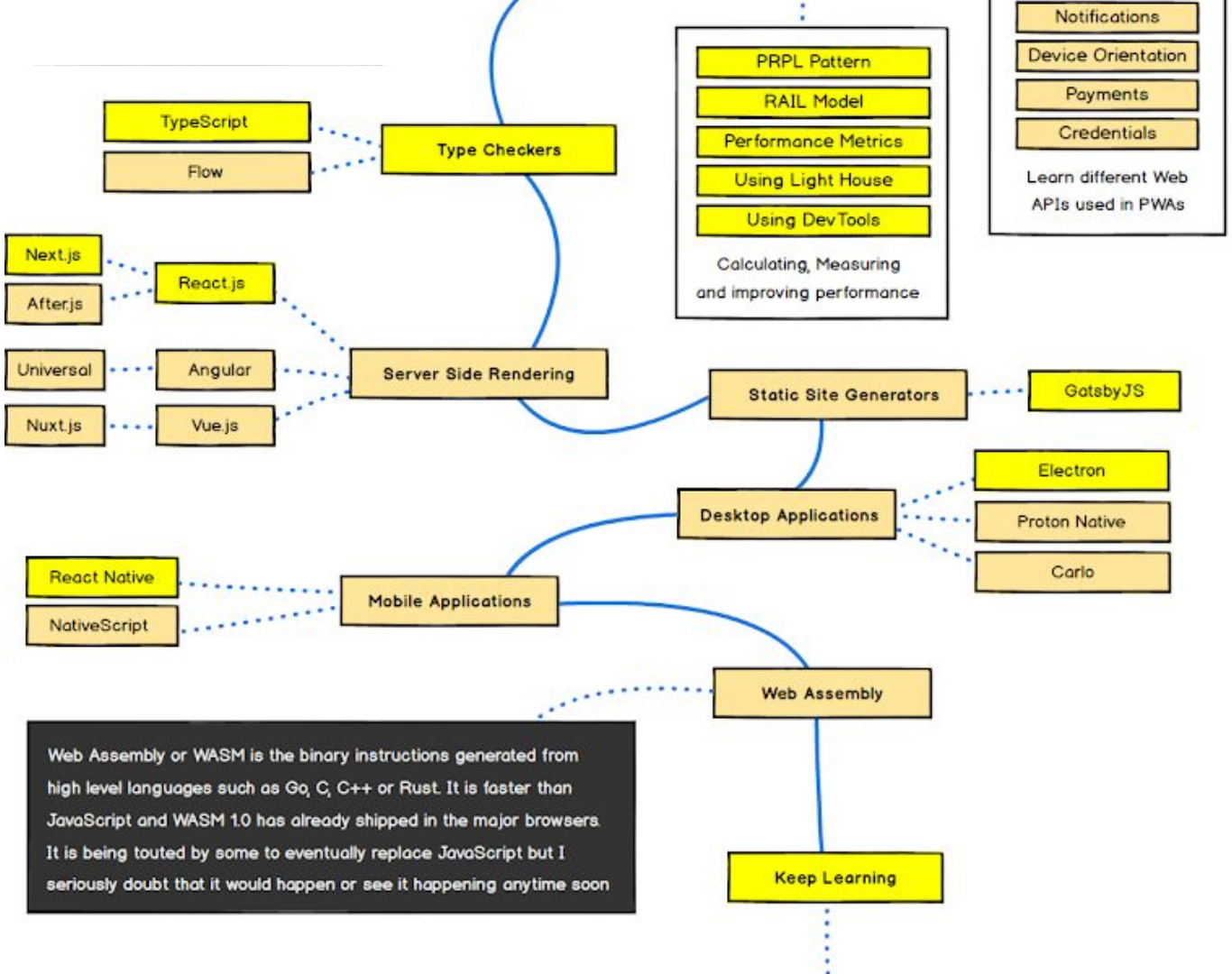
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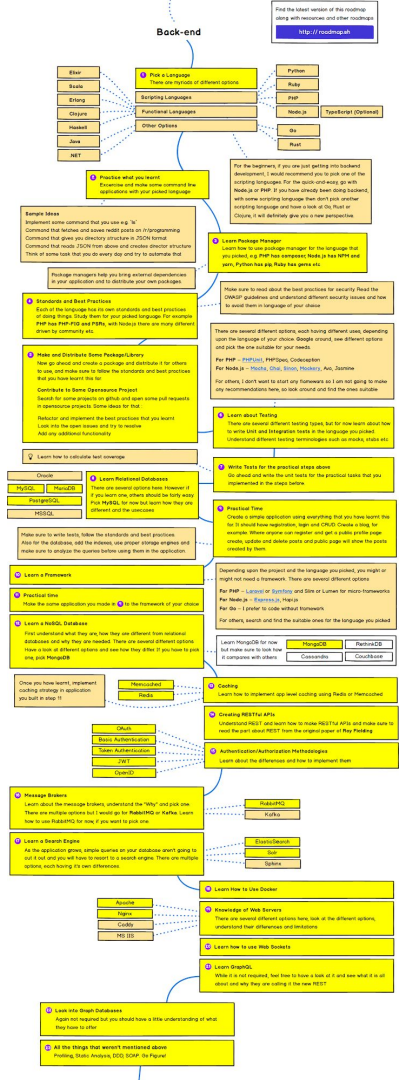
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Back-end
Elixir
Scala
Erlang
Clojure
Haskell
Java
.NET
1 Pick a Language
There are myriads of different options
Scripting Languages
Functional Languages
Other Options
Python
Ruby
PHP
Node.js
TypeScript (Optional)
Go
Rust
For the beginners, if you are just getting into backend development, I would recommend you to pick one of the scripting languages. For the quick-and-easy, go with Node.js or PHP. If you have already been doing backend, with some scripting language then don't pick another scripting language and have a look at Go, Rust or Clojure, it will definitely give you a new perspective.
2 Practice what you learnt
Excercise and make some command line applications with your picked language
Sample Ideas
Implement same command that you use e.g. 'ls'
Command that fetches and saves reddit posts on /r/programming
Command that gives you directory structure in JSON format
Command that reads JSON from above and creates director structure
Think of some task that you do every day and try to automate that
3 Learn Package Manager
Learn how to use package manager for the language that you picked, e.g. PHP has composer, Node.js has NPM and yarn, Python has pip, Ruby has gems etc.
Package managers help you bring external dependencies in your application and to distribute your own packages.
4 Standards and Best Practices
Each of the language has its own standards and best practices of doing things. Study them for your picked language. For example PHP has PHP-FIG and PSRs, with Node.js there are many different driven by community etc.
Make sure to read about the best practices for security. Read the OWASP guidelines and understand different security issues and how to avoid them in language of your choice
5 Make and Distribute Some Package/Library
Now go ahead and create a package and distribute it for others to use, and make sure to follow the standards and best practices that you have learnt this far.
Contribute to Some Opensource Project
Search for some projects on github and open some pull requests in opensource projects. Some ideas for that
Refactor and implement the best practices that you learnt
Look into the open issues and try to resolve
Add any additional functionality
There are several different options, each having different uses, depending upon the language of your choice. Google around, see different options and pick the one suitable for your needs.
For PHP – PHPUnit, PHPSpec, Codeception
For Node.js – Mocha, Chai, Sinon, Mockery, Ava, Jasmine
For others, I don't want to start any frameworks so I am not going to make any recommendations here, so look around and find the ones suitable
6 Learn about Testing
There are several different testing types, but for now learn about how to write Unit and Integration tests in the language you picked. Understand different testing terminologies such as mocks, stubs etc.
Learn how to calculate test coverage
7 Write Tests for the practical steps above
Go ahead and write the unit tests for the practical tasks that you implemented in the steps before.
Oracle
MySQL
MariaDB
PostgreSQL
MSSQL
8 Learn Relational Databases
There are several options here. However if you learn one, others should be fairly easy. Pick MySQL for now but learn how they are different and the usecases
9 Practical Time
Create a simple application using everything that you have learnt this far. It should have registration, login and CRUD. Create a blog, for example. Where anyone can register and get a public profile page, create, update and delete posts and public page will show the posts created by them
Make sure to write tests, follow the standards and best practices. Also for the database, add the indexes, use proper storage engines and make sure to analyze the queries before using them in the application.
10 Learn a Framework
Depending upon the project and the language you picked, you might or might not need a framework. There are several different options
For PHP – Laravel or Symfony and Slim or Lumen for micro-frameworks
For Node.js – Express.js, Hapi.js
For Go – I prefer to code without framework
For others, search and find the suitable ones for the language you picked
11 Practical time
Make the same application you made in 9 in the framework of your choice
12 Learn a NoSQL Database
First understand what they are, how they are different from relational databases and why they are needed. There are several different options. Have a look at different options and see how they differ. If you have to pick one, pick MongoDB.
Learn MongoDB for now but make sure to look how it compares with others.
MongoDB
RethinkDB
Cassandra
CouchBase
Once you have learnt, implement caching strategy in application you built in step 11
Memcached
Redis
13 Caching
Learn how to implement app level caching using Redis or Memcached
14 Creating RESTful APIs
Understand REST and learn how to make RESTful APIs and make sure to read the part about REST from the original paper of Roy Fielding.
OAuth
Basic Authentication
Token Authentication
JWT
OpenID
15 Authentication/Authorization Methodologies
Learn about the differences and how to implement them
16 Message Brokers
Learn about the message brokers, understand the "Why" and pick one. There are multiple options but I would go for RabbitMQ or Kafka. Learn how to use RabbitMQ for now, if you want to pick one.
RabbitMQ
Kafka
17 Learn a Search Engine
As the application grows, simple queries on your database aren't going to cut it out and you will have to resort to a search engine. There are multiple options, each having it's own differences
ElasticSearch
Solr
Sphinx
18 Learn How to Use Docker
Apache
Nginx
Caddy
IIS
19 Knowledge of Web Servers
There are several different options here, look at the different options, understand their differences and limitations
20 Learn how to use Web Sockets
21 Learn GraphQL
While it is not required, feel free to have a look at it and see what it is all about and why they are calling it the new REST
22 Look into Graph Databases
Again not required but you should have a little understanding of what they have to offer
23 All the things that weren't mentioned above
Profiling, Static Analysis, DDD, SOAP, Qi Figure!

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1 **Pick a Language**
There are myriads of different options

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  - Python
  - Ruby
  - PHP
  - Node.js
  - TypeScript (Optional)
- Functional Languages
  - Elixir
  - Scala
  - Erlang
  - Clojure
  - Haskell
  - Java
  - .NET
- Other Options
  - Go
  - Rust

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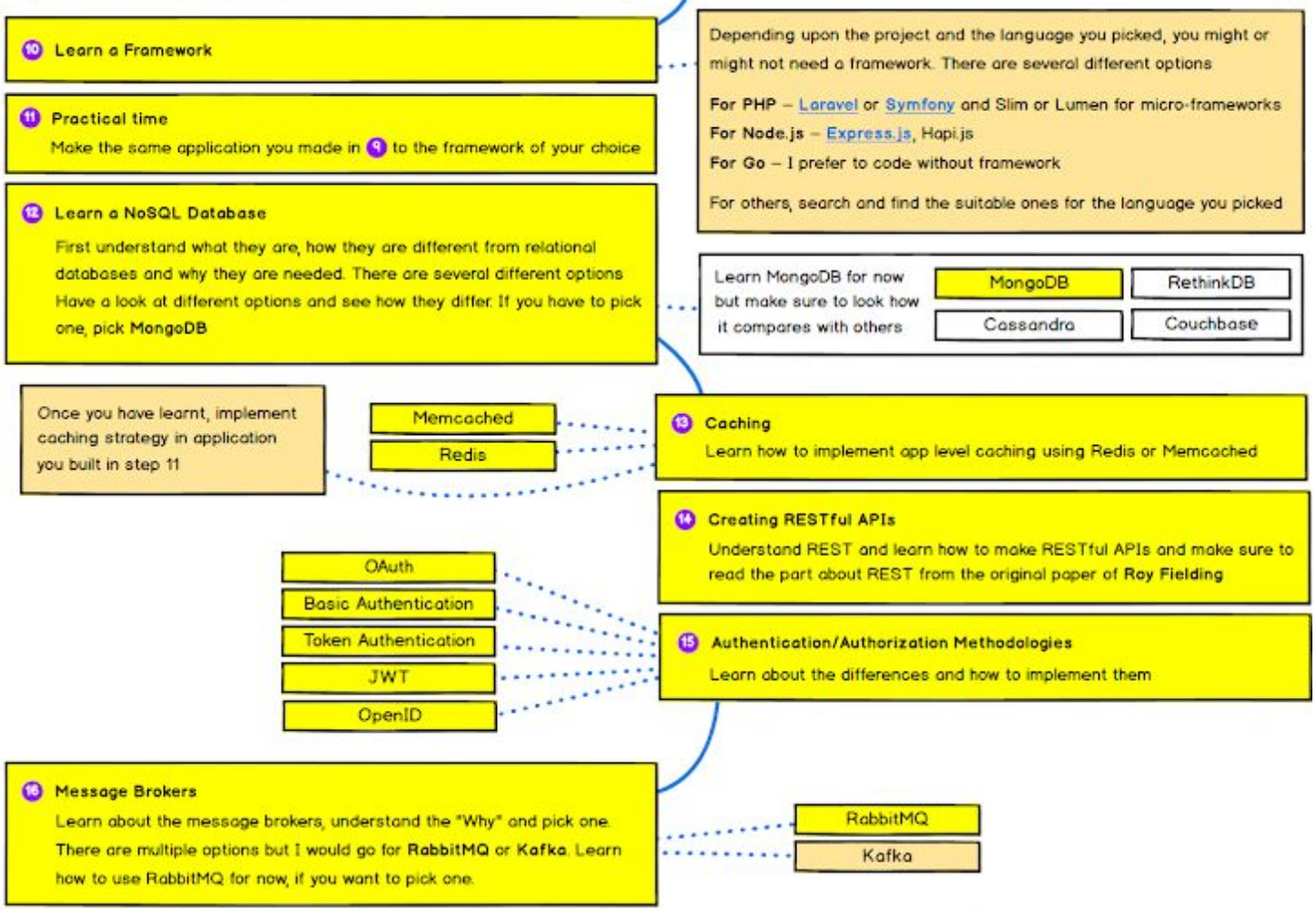
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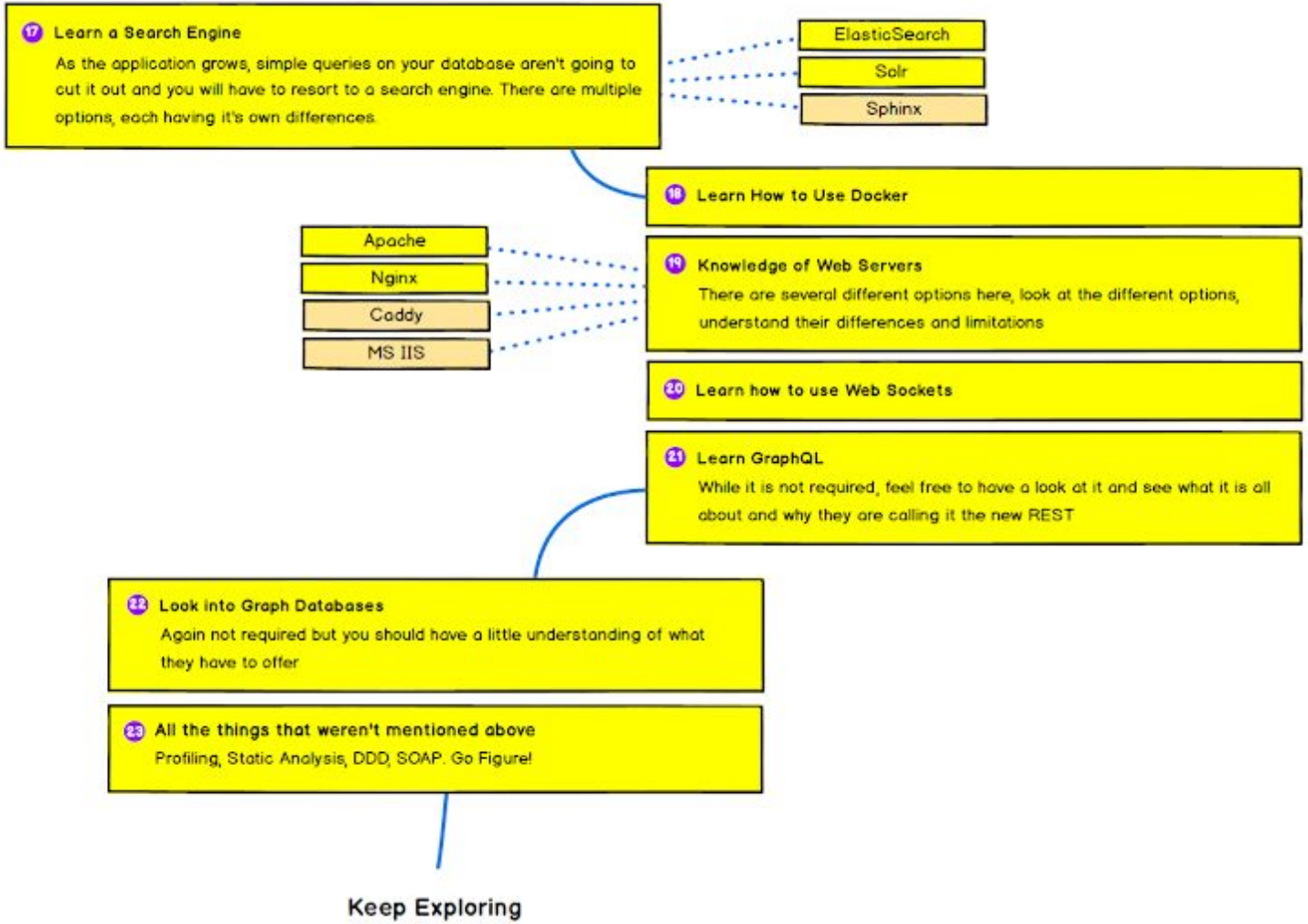
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