

<WA1/>  
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2022

# Applicazioni Web I Web Applications I

## Introduction to the course

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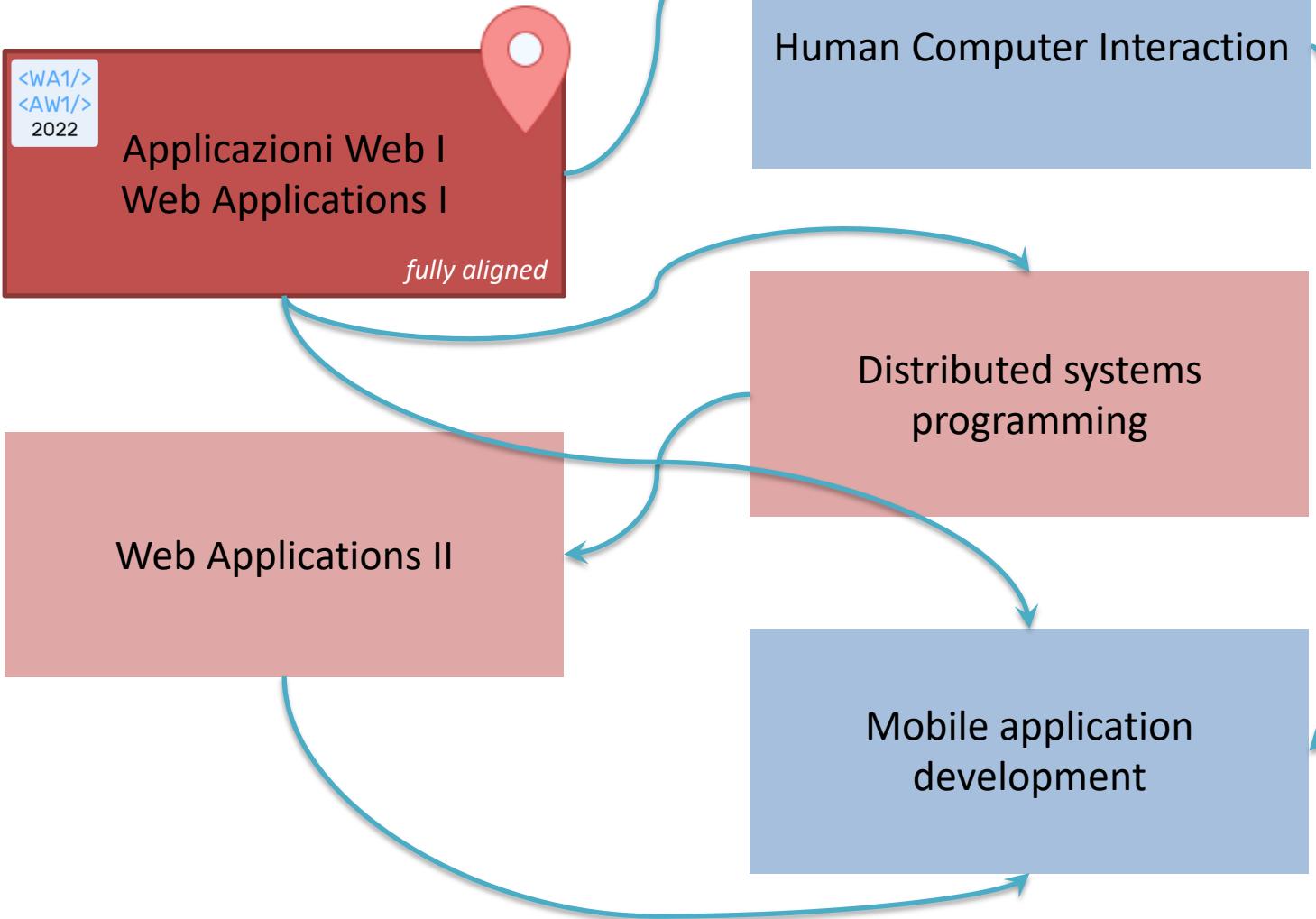


# Goal

- Understanding web architectures
- Understanding and mastering web application design and development
- Gaining in-depth knowledge of the JavaScript language and ecosystem
- Becoming familiar with one of the most popular JavaScript frameworks (React)
- ...with special focus on the front-end

# The Bigger Picture

- Web architecture
- JavaScript
- Browsers
- **Front-End** programming
- **Back-end** programming
- Scalability
- Large-scale



- Usability
- Interface design
- Human centered processes
- Distributed Architectures
- Protocols
- Foundations
- Mobile Front-End
- Mobile device programming



You are here

# What We Will Learn

## JavaScript as a language

- ECMAScript ES6
- Language constructs
- In-depth semantics
- Functional, Asynchronous, Modular, ...



## The browser ecosystem

- HTML, CSS, page structure
- DOM
- JavaScript in the browser
- Events, Properties, Handlers, APIs



## Single Page Applications

- Server-side (bare minimum) with node
- API development
- Backend storage
- Sessions and Authentication



## React framework

- Components, Properties, State
- JSX
- Hooks
- Router



# Weeks and Calendar... At a Glance!

1. Intro to JS: basics, objects, functions
2. Intro to JS: async programming, callbacks, DB interaction + Intro to Web
3. HTML, CSS, Bootstrap
4. JS: classes, modules, this + JS in the browser
5. Intro to React
6. React: props and state
7. React: context, life cycle, forms
8. React router
9. Server-side with Express
10. Fetch and client-server interaction (in React)
11. Authentication

# Course Organization

- Classes
  - 3 h/week
  - Lectures + Exercises (*mixed*)
- Laboratories (8I or 9I)
  - 1.5 h/week
  - 3 Lab groups (split to be discussed)
  - 3 Labs + 2 BigLabs, starting 2<sup>nd</sup> week
- **Exception:** first week
  - Class instead of Lab

	MO	TU	WE	TH	FR
08:30		27		8I	
10:00		27		8I	
11:30				9I	
13:00					
14:30					
16:00					
17:30					

# Classes

- In person, in rooms with power outlets at the desks
  - bring your own computer, if possible, to follow the examples/exercises
- Video-recorded and made available soon after each class
  - *not* streamed live
- A few times during the course, we will give you some materials to read/watch before a lecture
  - relatively *short* and published *in advance*

# Laboratories

- Starting March 10, 2022
- In rooms with power outlets at the desks
- Text online, some days in advance
- Exercises to be done during Lab hours
- Solution will be posted on GitHub
  - around 1 week after the end of each lab

# Laboratories

- In (fixed) group
  - 3-4 people
  - you decide the team
  - fill this out with your group composition (deadline March 6, 2022):  
<https://docs.google.com/forms/d/1kNxHL8rJGjfSx2zpAkfxkHWHZIGhChCd6ggNt1RERdc/edit>
- 3 Labs, each long 1.5 hours
- 2 BigLabs, each long 6 hours
  - if submitted, each BigLab gives up to +1 point to the exam
  - evaluated as a group
  - detailed instructions will follow

# Learning Material

- Course website – <http://media.polito.it/aw1>
  - Slides (in English)
  - Full schedule
  - Links and supplementary material
- Video lectures (screencasts)
  - YouTube - <https://www.youtube.com/playlist?list=PLuZyhAOPm9pNj46XkNvtHLgQNCutui0ti>
  - Portale della Didattica
- GitHub - <https://github.com/polito-WA1-AW1-2022>
  - Examples, exercises, labs, exams, ...

The screenshot shows the e-Lite website interface. At the top, there's a navigation bar with links to HOME, NEWS, PEOPLE, RESEARCH, TEACHING (which is highlighted in red), THESIS, JOBS, and a search bar. Below the navigation is a breadcrumb trail: HOME • TEACHING • CURRENT COURSES • 01TXYOV - WEB APPLICATIONS I. A small note indicates the page was last updated on 26 February 2020. The main content area is titled '01TXYOV - WEB APPLICATIONS I'. It includes a brief description of the course, its official website, short link, and latest news. On the right side, there's a sidebar titled 'ARTICLE INDEX' with links to 'Schedule', 'Resources', 'Exam', and 'All Pages'. Below the sidebar, there's a section for 'BASIC INFORMATION' containing details like title, credits, year, semester, language, and teachers.



# Slack



- We will use Slack for all communications
  - among students, with teachers, etc.
  - new to Slack? -> <https://slack.com/resources/using-slack/how-to-use-slack>
- Join with your @studenti.polito.it email at <https://join.slack.com/t/aw1-2022/signup>
- Announcements and official information in **#general**
- Feel free to contact the teachers for feedback and questions in **#discussion**
  - questions of general interest must be posted there, so that everybody can see the answer

# About the Exam

1. Project development
  - Individual
  - up to 24 points (minimum: 12)
  - 20 days of time
2. Oral discussion (on the project)
  - individual and mandatory
  - up to 6 points
3. BigLabs evaluation
  - *optional* (i.e., if submitted as a group)
  - up to 2 points -> the only way to get 30L

Full exam rules in the course website (under "Exams")

# Project Development

## What

- Develop a web application using
  - React + JavaScript
  - Node + Express
  - SQLite
- According to a functional specification
  - published 20 days before each official exam date

## How

- Individually (i.e., not in group)
- Using GitHub Classroom
  - commit + push your project
- Teacher's Evaluation
  - running the application on a clean recent Linux distro (with node)
  - examining the code

# Oral Discussion

## Goals

- To ensure that each student developed the web application by themselves
- To evaluate how much the student can explain the exact behaviour of the code

## Evaluation Criteria

- Theoretical and practical knowledge of the project design
- Theoretical and practical knowledge of the project code base
- Readiness and clarity in the replies

# Resources (fundamentals)

The screenshot shows the MDN homepage with a blue header bar. The main title is "Resources for developers, by developers." Below the header, there are several sections: "The browser built for devs" (with a note about `width`), "Learn the best of web development" (with a "Sign up now" button), "Hacks Blog" (with a post about "Securing Firefox with WebAssembly"), and "Help improve MDN" (with links to "Getting started" and "Editorial review"). At the bottom, there's a news item from February 25, 2020, by Nathan Frey.

Mozilla Developer Network  
(MDN)  
<https://developer.mozilla.org/>

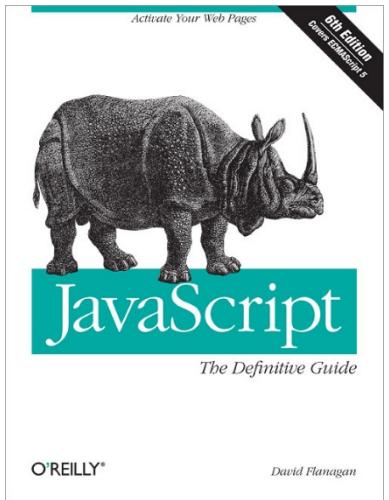
A screenshot of the MDN navigation menu. It includes two main dropdown menus: "Technologies" (highlighted) and "References & Guides". The "Technologies" menu lists categories like HTML, CSS, JavaScript, Graphics, HTTP, APIs / DOM, Browser Extensions, and MathML. The "References & Guides" menu lists categories like Learn web development, Tutorials, References, Developer Guides, Accessibility, Game development, and ...more docs.

The screenshot shows the React library homepage. The main title is "React: A JavaScript library for building user interfaces". Below the title, there are three main sections: "Declarative", "Component-Based", and "Learn Once, Write Anywhere". Each section has a brief description and a link to "Get Started" or "Take the Tutorial". On the right side, there's a "LIVE JSX EDITOR" window showing a simple component definition.

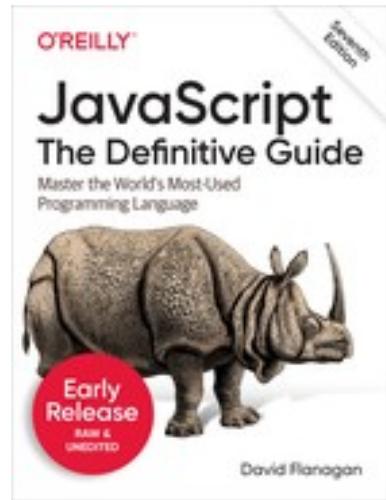
React Library  
<https://reactjs.org/>

A screenshot of the React library documentation. It features a sidebar with categories like "MAIN CONCEPTS", "ADVANCED GUIDES", "API REFERENCE", "HOOKS", "TESTING", "CONCURRENT MODE (EXPERIMENTAL)", and "CONTRIBUTING". The main content area contains detailed documentation for various React concepts, such as "Hello World", "Rendering Elements", "Components and Props", "State and Lifecycle", and "Conditional Rendering".

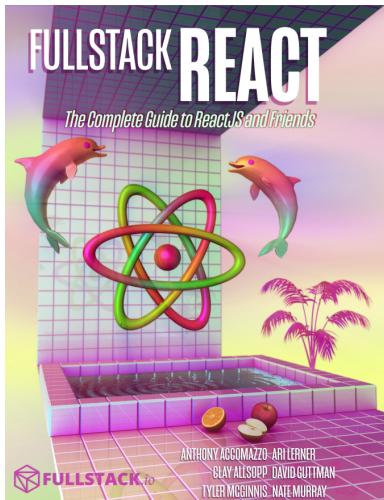
# Resources (books)



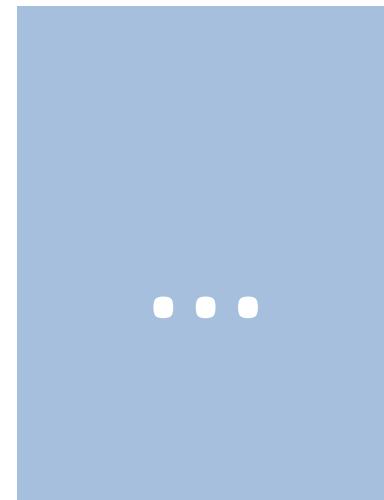
JavaScript: The Definitive Guide,  
6th Edition  
By David Flanagan  
ISBN 978-0596805524  
*Release Date: May 2011*  
(not very updated...)



JavaScript: The Definitive Guide,  
7th Edition  
By David Flanagan  
ISBN 978-1491952023  
*Release Date: July 2020*

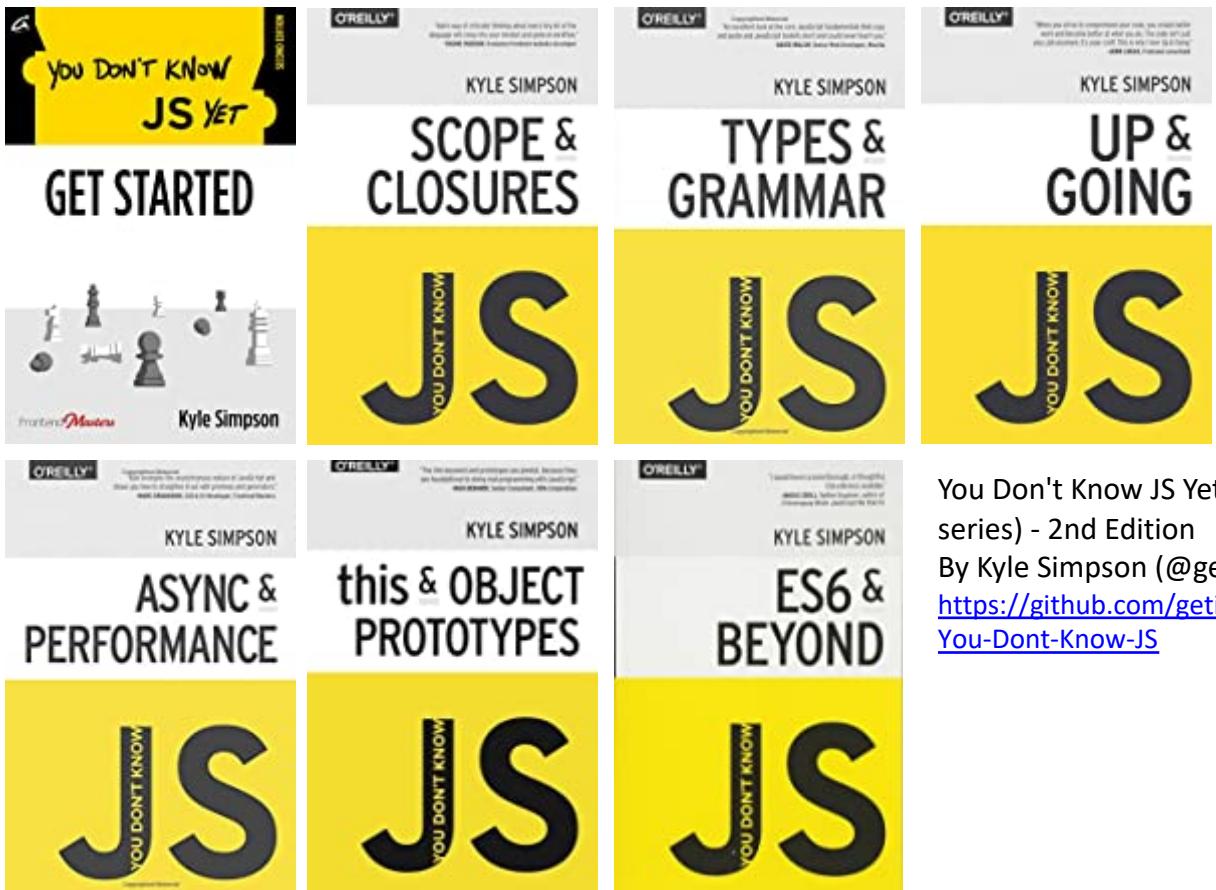


Fullstack React  
By Anthony Accomazzo, Nate Murray, Ari Lerner, Clay Allsopp, David Guttman, and Tyler McGinnis  
<https://www.newline.co/fullstack-react>  
*Release: r40 (January 2020)*

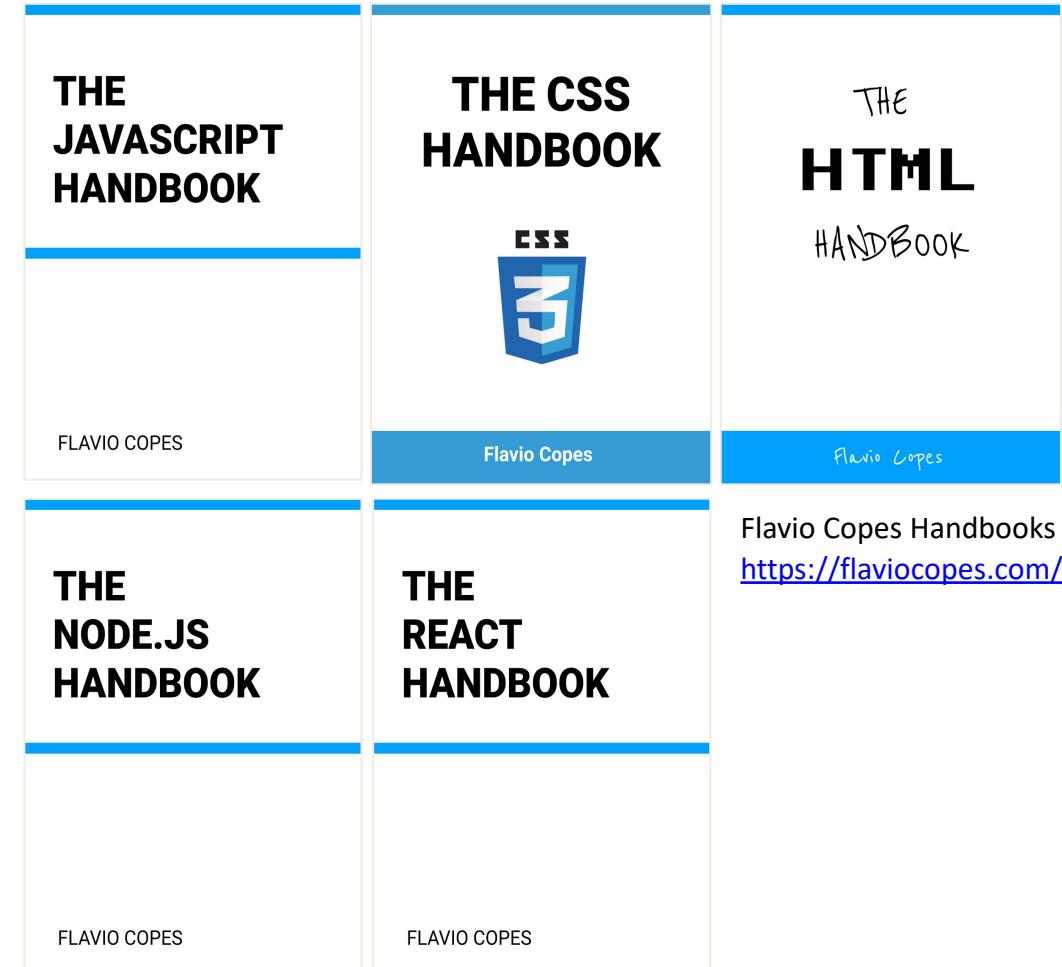


... and many others

# Resources (on-line books)

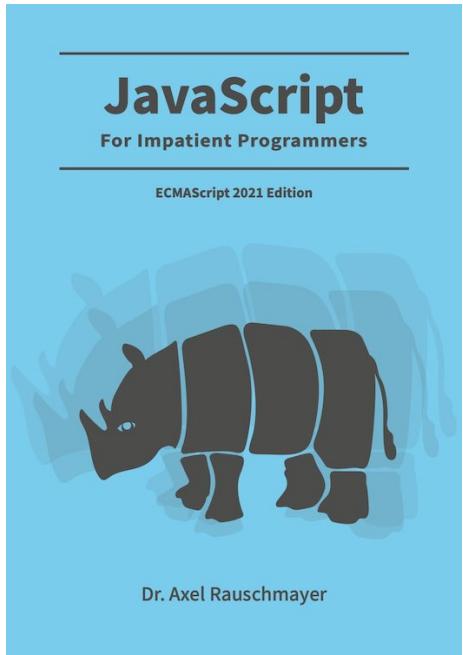


You Don't Know JS Yet (book series) - 2nd Edition  
By Kyle Simpson (@getify)  
<https://github.com/getify/You-Dont-Know-JS>



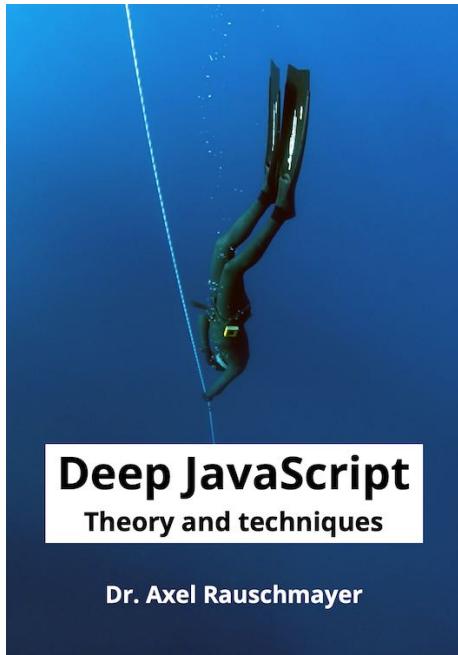
Flavio Copes Handbooks  
<https://flaviocopes.com/>

# Resources (on-line books)

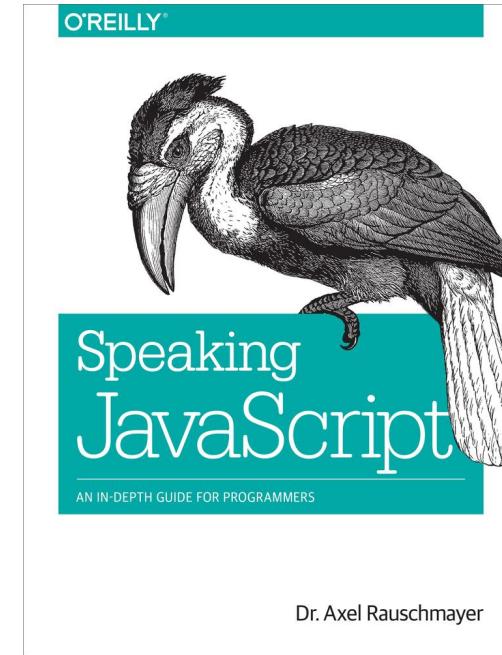


<https://exploringjs.com/impatient-js/index.html>

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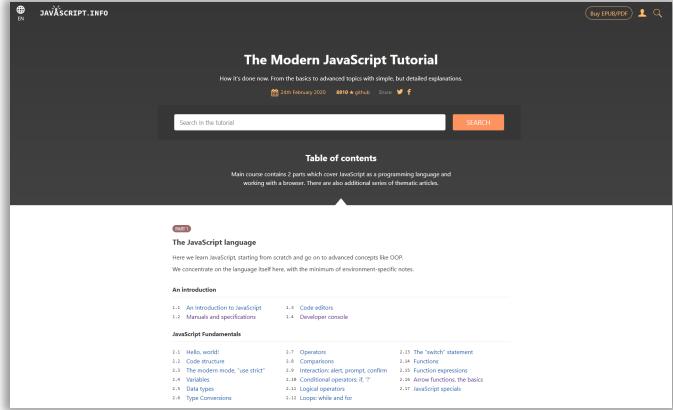


<https://exploringjs.com/deep-js/index.html>

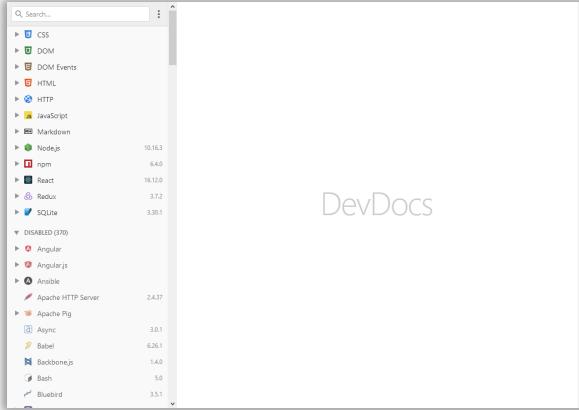


<http://speakingjs.com/>

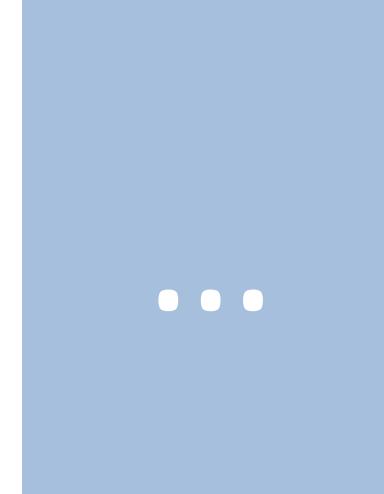
# More resources...



The Modern JavaScript Tutorial  
<https://javascript.info/>

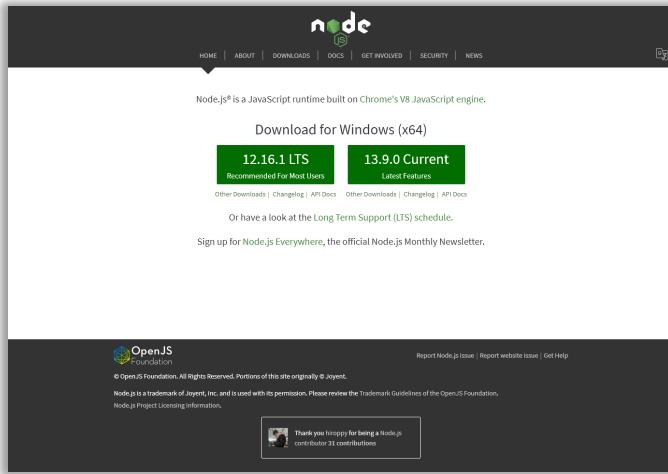


DevDocs: API Documentation  
Browser  
<https://devdocs.io/>



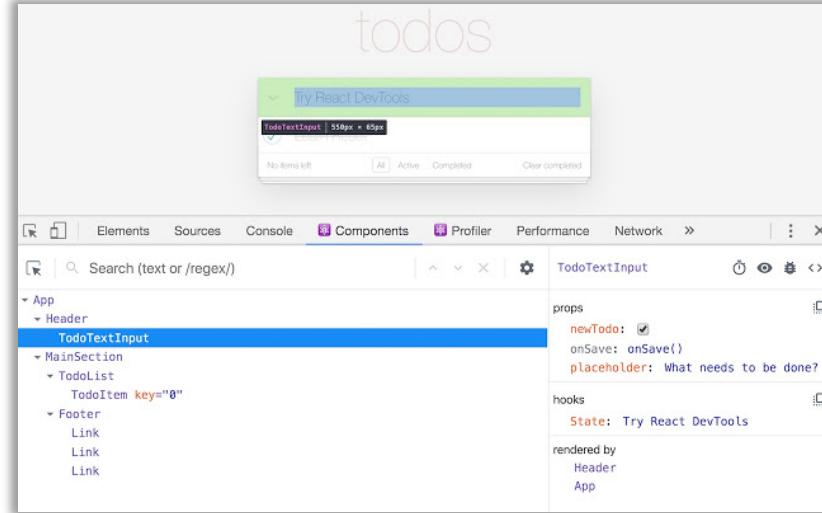
... and many others

# Tools



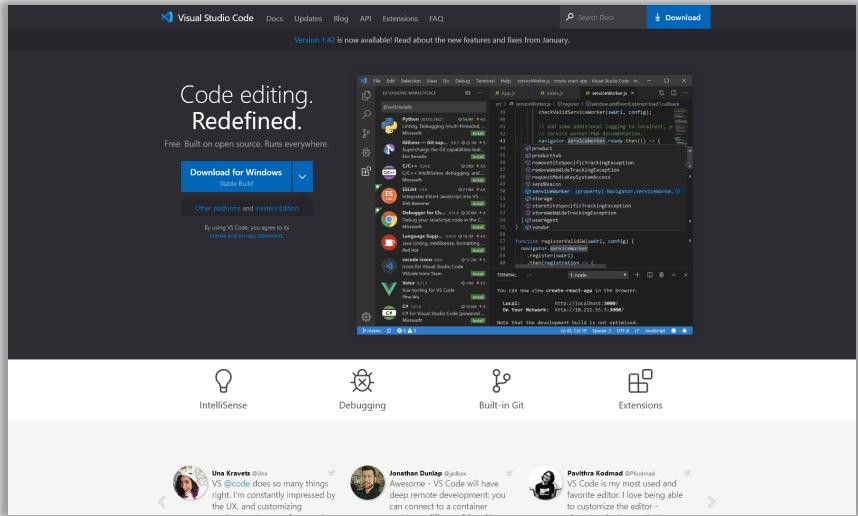
Node.js runtime  
Version 16.14 LTS  
<https://nodejs.org/en/>

Install on Linux using the instructions on  
<https://github.com/nodesource/distributions>

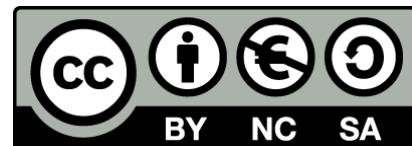


React Developer Tools  
*Extension for [Chrome](#) and [Firefox](#)*

# Programming Environment



Visual Studio Code  
<https://code.visualstudio.com/>



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