

<WA1/>  
<AW1/>  
2023

# Applicazioni Web I Web Applications I

## Introduction to the course

Fulvio Corno, **Luigi De Russis**, Enrico Masala

**Luca Mannella**, Juan Pablo Saenz, Antonio Servetti

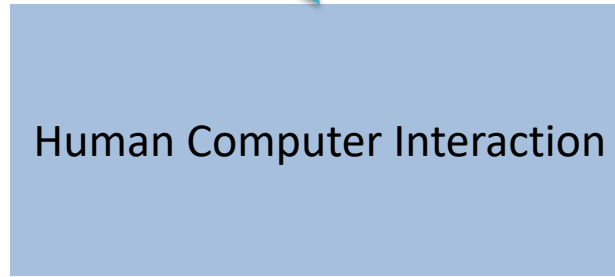


# Goal

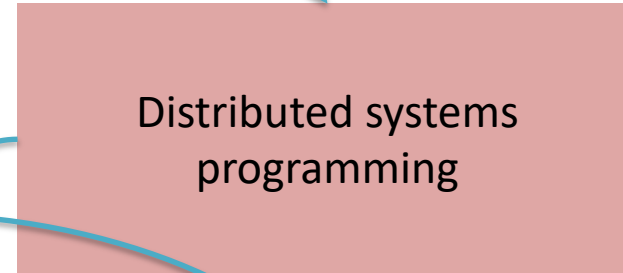
- Understanding web architectures
- Understanding and mastering web application design and development
- Gaining in-depth knowledge of the JavaScript language and ecosystem
- Becoming familiar with one of the most popular JavaScript frameworks (React)
- ...with special focus on the front-end

# The Bigger Picture

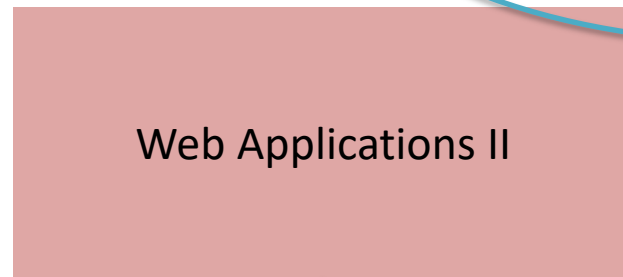
- Web architecture
- JavaScript
- Browsers
- **Front-End** programming
- **Back-end** programming
- Scalability
- Large-scale



- 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 JavaScript logo, consisting of the letters 'JS' in a bold, black, sans-serif font on a yellow square background.

## 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 (room 5i)
  - 1.5 h/week
  - 2 Lab groups (see later for the split)
  - Starting 2<sup>nd</sup> week
- **Exception:** first week
  - Class instead of Lab

	MO	TU	WE	TH	FR
08:30		1P		5i	
10:00		1P		5i	
11:30					
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 09/03/2023
- 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

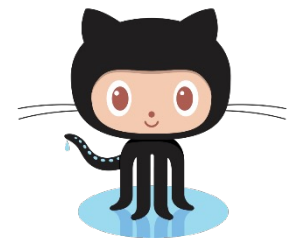
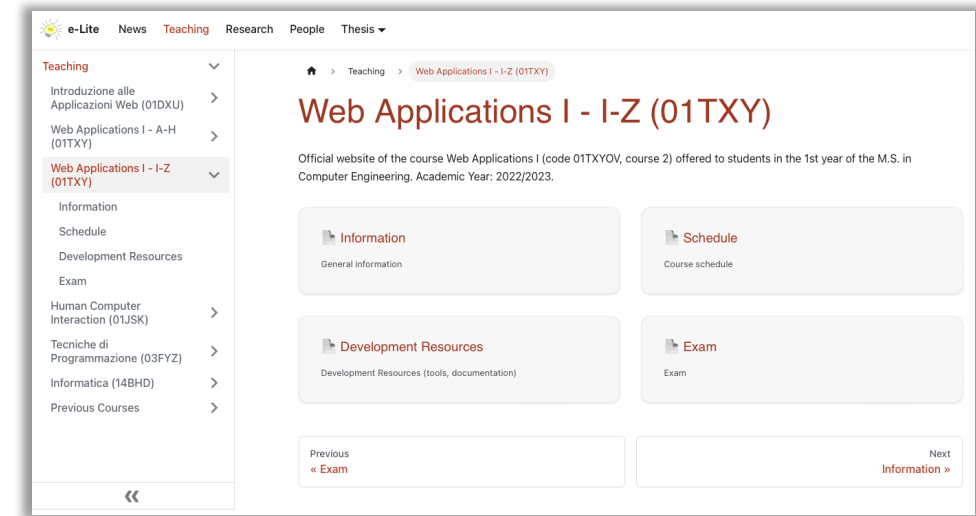


# Laboratories

- You will build a simple project during the labs
  - Step by step, following the course topics
- Some labs will last one week, others will span multiple weeks
- Two slots, divided by surname:
  - IA-OU
  - PA-ZZ

# Learning Material

- Course website – <https://bit.ly/polito-wa1-iz>
  - Slides (in English)
  - Full schedule
  - Links and supplementary material
- Video lectures (screencasts)
  - YouTube - [https://www.youtube.com/playlist?list=PLs7DWGc\\_wmwTGEyUzKpqQDaa5TSnhshmp](https://www.youtube.com/playlist?list=PLs7DWGc_wmwTGEyUzKpqQDaa5TSnhshmp)
  - Portale della Didattica
- GitHub - <https://github.com/polito-WA1-AW1-2023>
  - Examples, exercises, labs, exams, ...



# Communications



- We will use **Telegram** for the main communications
  - Among students, with teachers, etc.
  - Announcements, official information, and Q&A (separate “topics”)
- Feel free to contact the teachers for feedback and questions
  - questions of general interest must be posted in the group, so that everybody can see the answer
- Link to the Telegram group: <https://t.me/+fB0I10VAm7A1Zjdk>
- Emails can be an **alternative** for slower, more articulated, and private individual communications
- **Student Hours:** on request, either in person (in my office) or remotely (Zoom)

# About the Exam

## 1. Project development

- Individual
- up to 26 points
- 20 days of time

## 2. Oral discussion (on the project)

- individual and mandatory
- “live” correction of the submitted project and discussion
- up to 6 points
- when: the official exam day (or starting from that day)

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

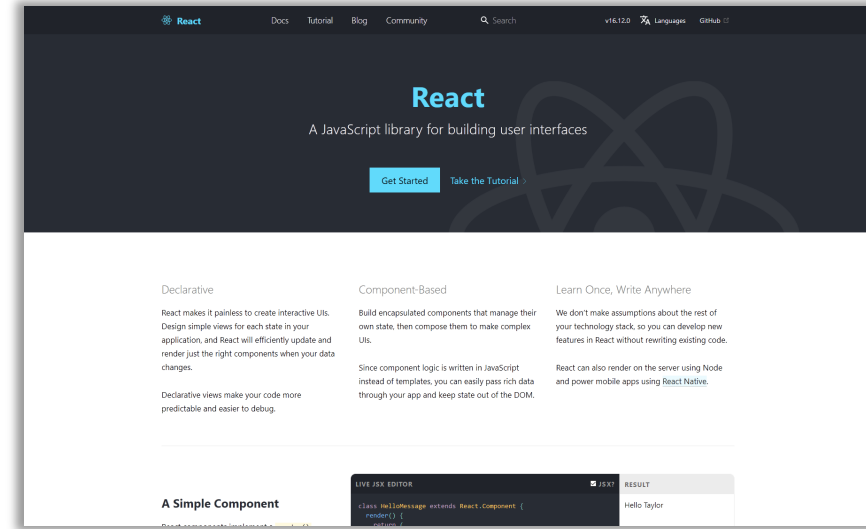
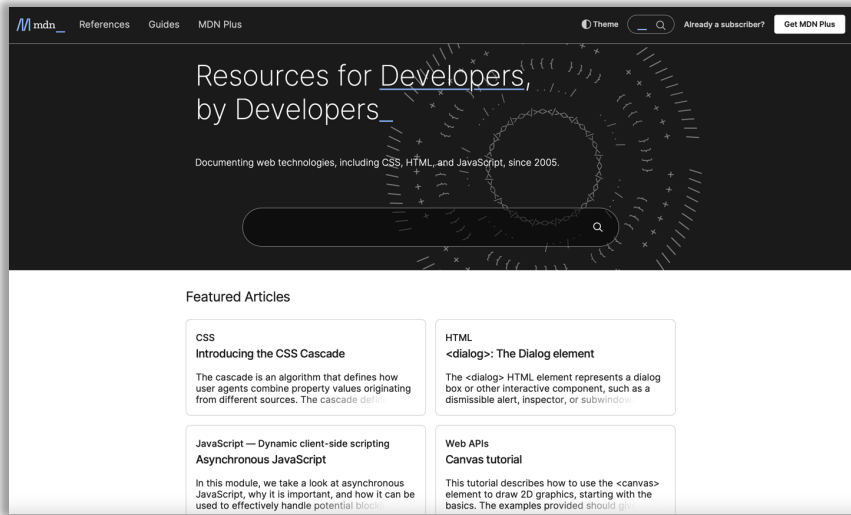
## Goals

- 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

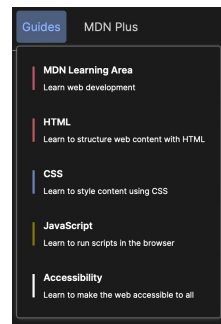
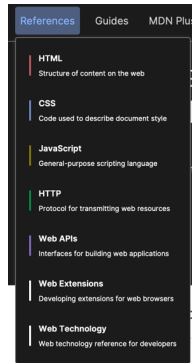
## Evaluation Criteria

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

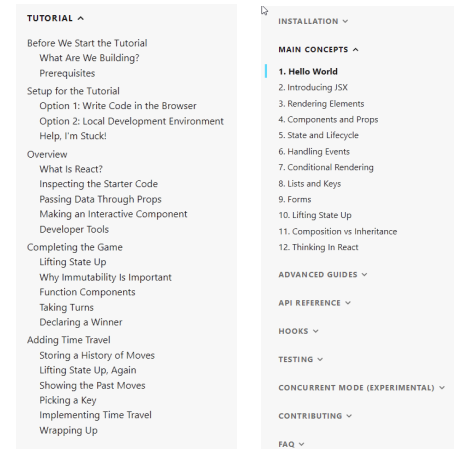
# Resources (fundamentals)



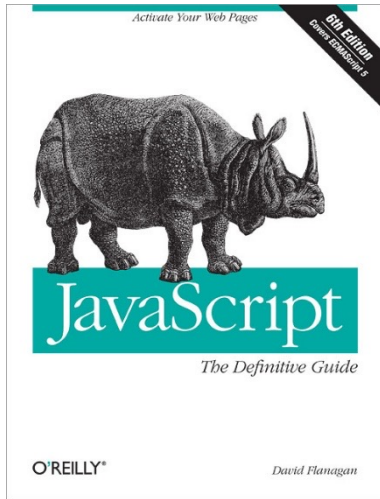
Mozilla Developer Network  
(MDN)  
<https://developer.mozilla.org/>



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



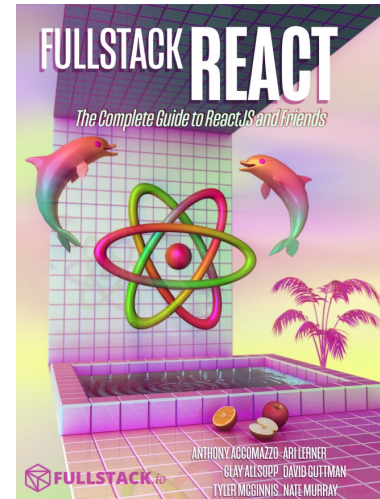
# Resources (books)



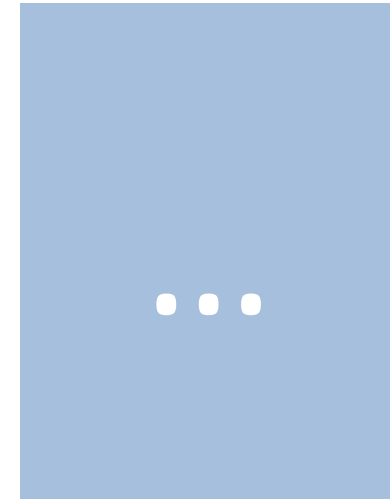
JavaScript: The Definitive Guide,  
6th Edition  
By David Flanagan  
ISBN 978-0596805524  
*Release Date: May 2011*  
(not very updated...)



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)



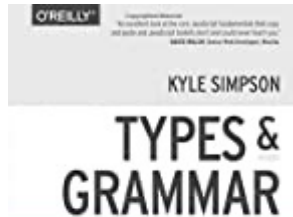
GET STARTED



Kyle Simpson



SCOPE & CLOSURES



TYPES & GRAMMAR



UP & GOING



ASYNC & PERFORMANCE



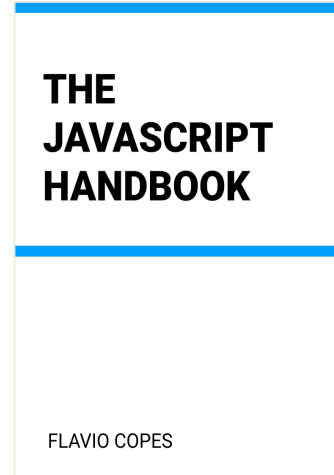
this & OBJECT PROTOTYPES



ES6 & BEYOND



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



THE JAVASCRIPT HANDBOOK

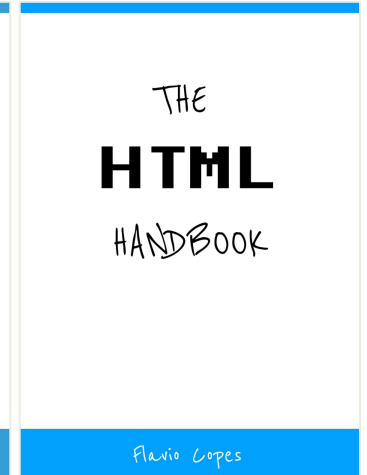
FLAVIO COPES



THE CSS HANDBOOK

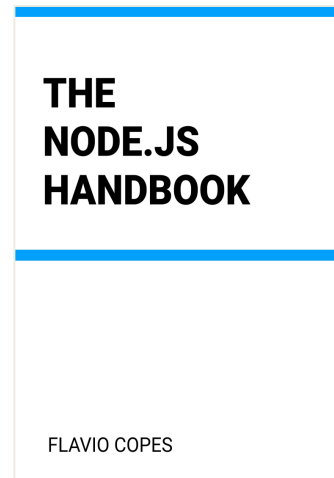


Flavio Copes



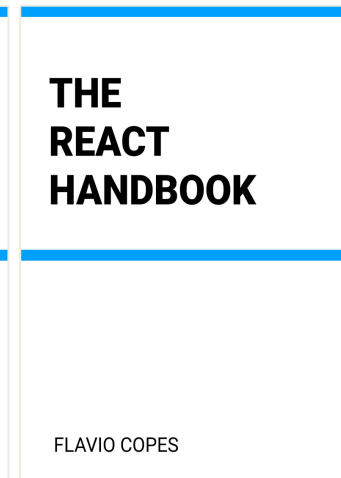
THE HTML HANDBOOK

Flavio Copes



THE NODE.JS HANDBOOK

FLAVIO COPES

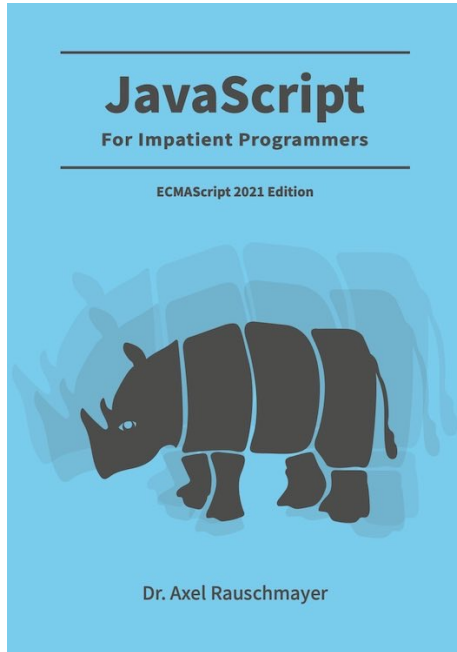


THE REACT HANDBOOK

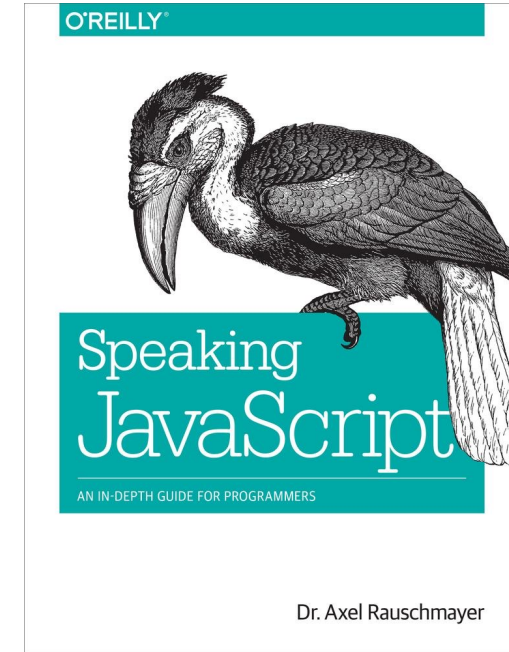
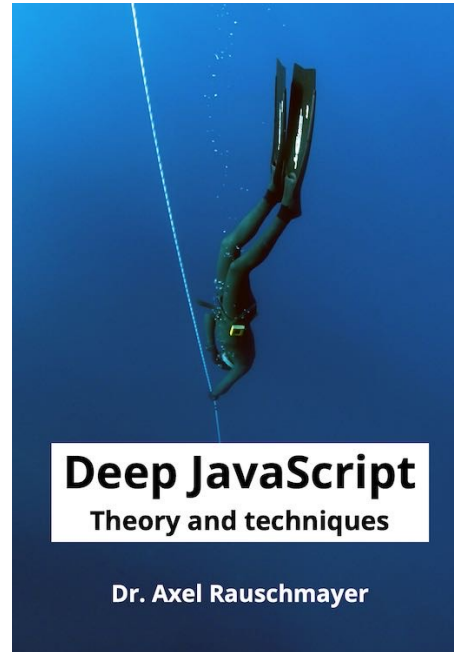
FLAVIO COPES

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

# Resources (on-line books)



+

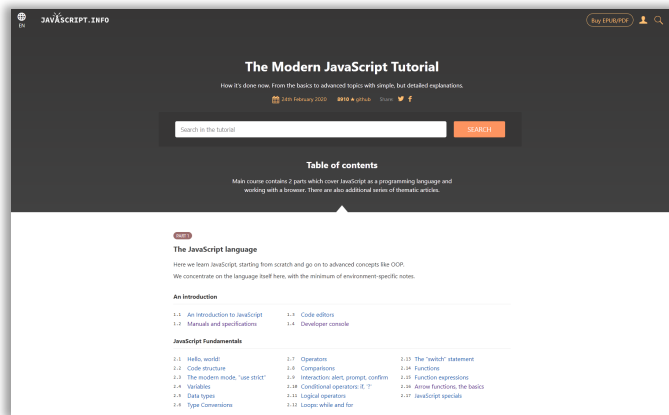


<https://exploringjs.com/impatient-js/index.html>

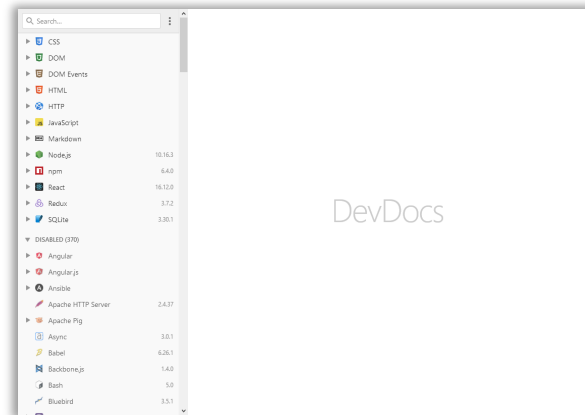
<https://exploringjs.com/deep-js/index.html>

<http://speakingjs.com/>

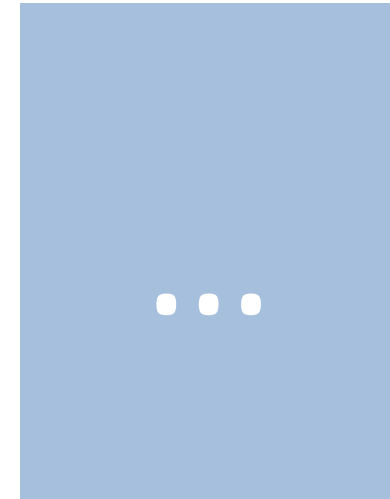
# More resources...



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

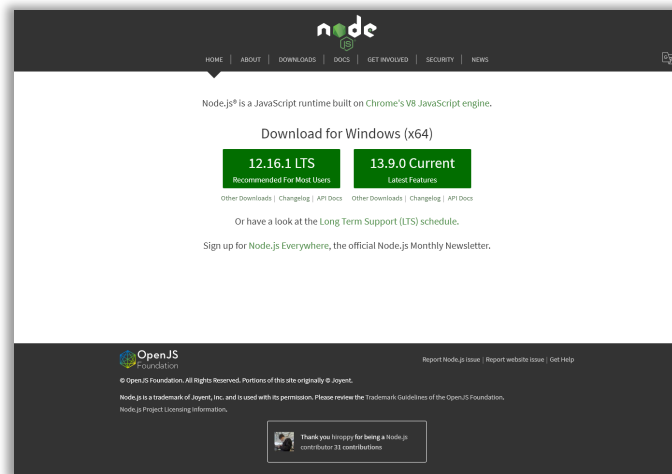


DevDocs: API Documentation  
Browser  
<https://devdocs.io/>



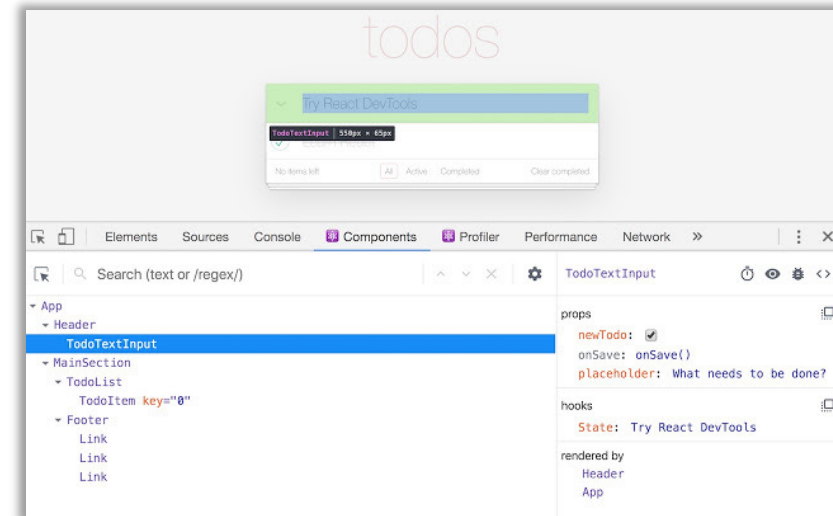
... and many others

# Tools



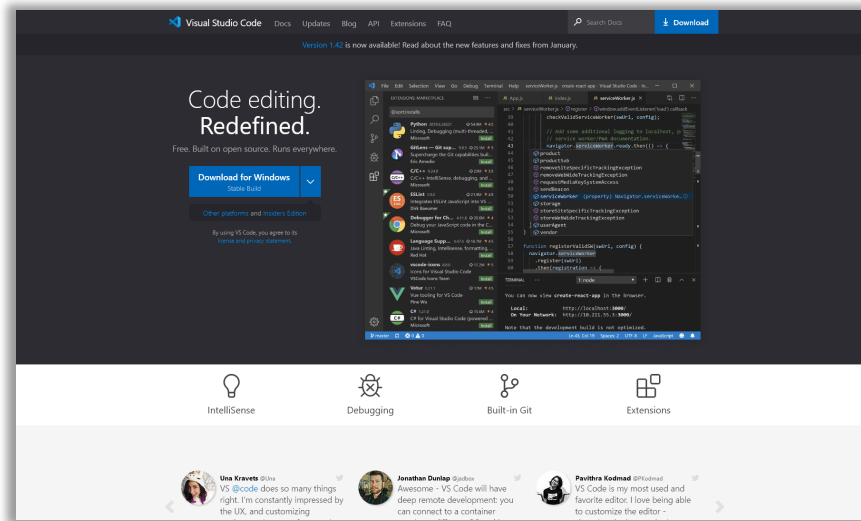
Node.js runtime  
Version 18.14 LTS  
<https://nodejs.org/en/>

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/>



# License

- These slides are distributed under a Creative Commons license “**Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0)**”
- **You are free to:**
  - **Share** — copy and redistribute the material in any medium or format
  - **Adapt** — remix, transform, and build upon the material
  - The licensor cannot revoke these freedoms as long as you follow the license terms.
- **Under the following terms:**
  - **Attribution** — You must give [appropriate credit](#), provide a link to the license, and [indicate if changes were made](#). You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.
  - **NonCommercial** — You may not use the material for [commercial purposes](#).
  - **ShareAlike** — If you remix, transform, or build upon the material, you must distribute your contributions under the [same license](#) as the original.
  - **No additional restrictions** — You may not apply legal terms or [technological measures](#) that legally restrict others from doing anything the license permits.
- <https://creativecommons.org/licenses/by-nc-sa/4.0/>

