<WA1/>
<AW1/>
2021

# Applicazioni Web I
# Web Applications I

**Introduction to the course**

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

Luca Mannella, Alberto Monge Roffarello, Juan Pablo Saenz,
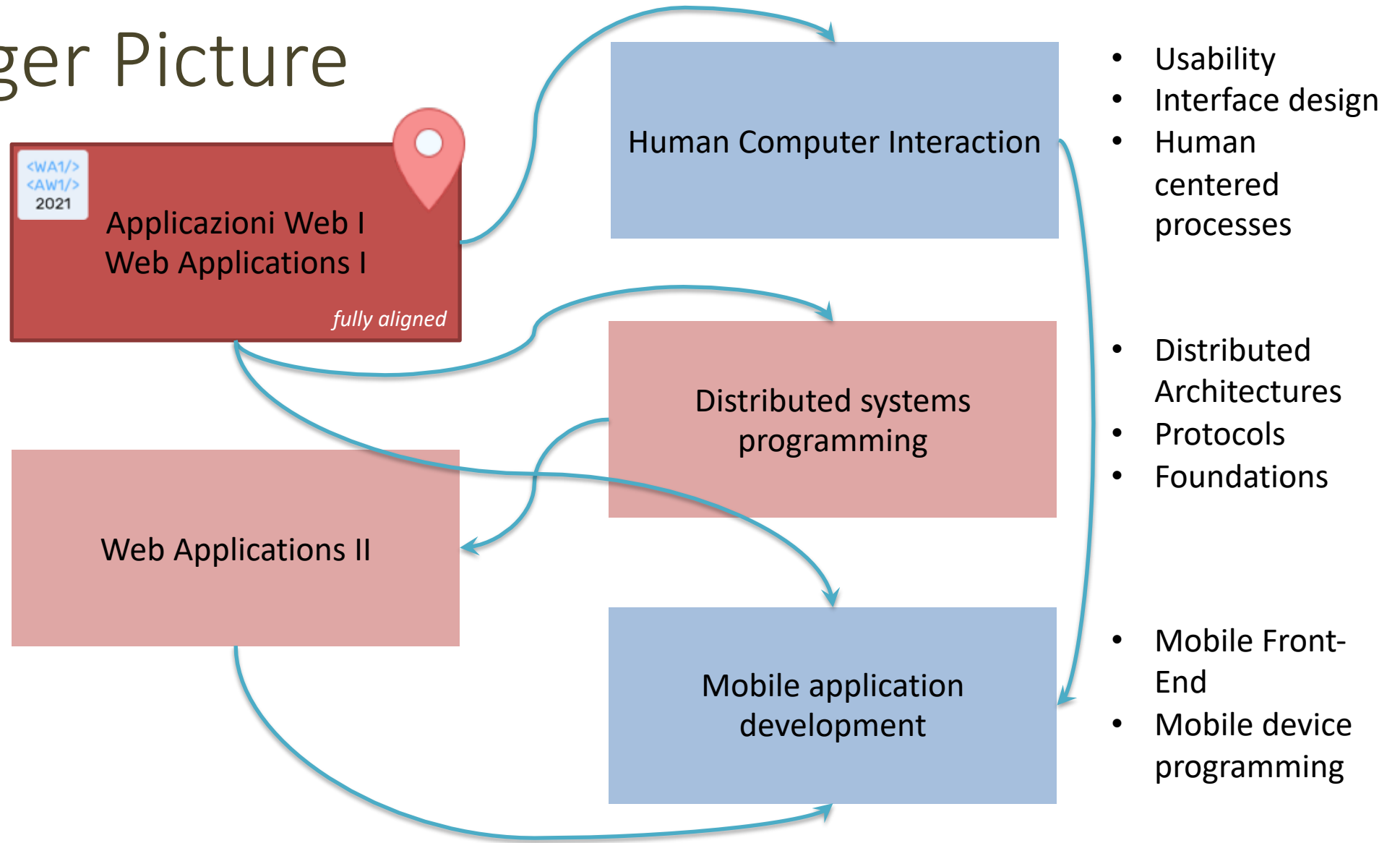**Antonio Servetti**

# 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

**Applicazioni Web I
Web Applications I**

`<WA1/>`
`<AW1/>`
`2021`

*fully aligned*

**Human Computer Interaction**

**Distributed systems programming**

**Web Applications II**

**Mobile application development**

- 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 | The browser ecosystem | Single Page Applications | React framework |
|---|---|---|---|
| • ECMAScript ES6<br>• Language constructs<br>• In-depth semantics<br>• Functional, Asynchronous, Modular, … | • HTML, CSS, page structure<br>• DOM<br>• JavaScript in the browser<br>• Events, Properties, Handlers, APIs | • Server-side (bare minimum) with node<br>• API development<br>• Backend storage<br>• Sessions and Authentication | • Components, Properties, State<br>• JSX<br>• Hooks<br>• Router |

# Weeks and Calendar… At a Glance! (tentative)

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  (course 1, letters A-L)

- Classes
  - 3 h/week
  - Lectures + Exercises (*mixed*)

- Laboratories (Online + room R1)
  - 1.5 h/week

  Book on the Portale!

  - 2 Lab groups (online + in presence)
  - 3 Labs + 2 **BigLabs**, starting 3rd week

- **Exception**: first 2 weeks,
  - Class instead of Lab

|       | MO     | TU | WE | TH     | FR |
|-------|--------|----|----|--------|----|
| 08:30 |        |    |    | Online |    |
| 10:00 | Online |    |    | Online |    |
| 11:30 | R1     |    |    |        |    |
| 13:00 |        |    |    |        |    |
| 14:30 |        |    |    |        |    |
| 16:00 |        |    |    |        |    |
| 17:30 |        |    |    |        |    |

# Classes

- On-line, all recorded

- Using Zoom
  - For all the lectures
  - Link: https://polito-it.zoom.us/j/93723698435?pwd=c1p0QWJ6UmlTajdoUUtvTGpvM2Ixdz09

- During the lectures, comments and questions will be handled in a dedicated Slack channel
  - #live-lecture

# Laboratories

- Starting 15/03/2021

- 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: https://forms.gle/8nJ2G4zTgdnJCMot8
  - before March 14
- 3 Labs, each 1.5 hours long
- 2 BigLabs, each 6 hours long
  - if submitted, each BigLab gives up to +1 point to the exam
  - evaluated as a group
  - detailed instructions will follow

# Online Labs

- Connection over Zoom/Virtual Classroom

- Each group will enter a Zoom room/Virtual Classroom Breakout room
    - May work together

- Teachers will enter the rooms
    - When students request help
    - For a quick check

# Learning Material

- Course website – http://media.polito.it/aw1
  - Link to slides (in English)
  - Full schedule
  - Links and supplementary material

- Video lectures (screencasts)
  - YouTube - https://www.youtube.com/playlist?list=PLuZyhAOPm9pMeztcby2E7B2QsLVgW_bK8
  - Portale della Didattica

- GitHub - https://github.com/polito-WA1-AW1-2021
  - Examples, exercises, labs, exams, …

# 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 <link>
- During the lectures, comments and questions will be handled in the **#live-lecture** channel
  - Typically, not in the Zoom/Virtual Classroom chat (so history is retained)
- Announcements and official information in **#general**
- Feel free to contact the teachers for feedback and questions in **#discussion**

# 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, mandatory to achieve 30L

Full exam rules in the course website ("Exam" section)

# Project Development

**What**

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

**How**

- Individually (i.e., <u>not</u> in group)
- Using GitHub Classroom
  - commit + push your project
- Teacher's Evaluation
  - running the application on a clean Ubuntu 20.04 (with node >= 14.15)
  - 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)
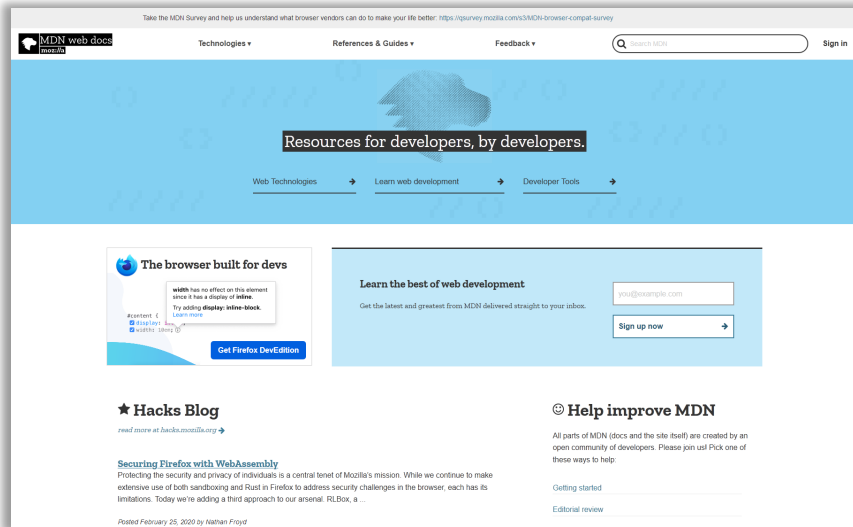


Mozilla Developer Network (**MDN**)
https://developer.mozilla.org/
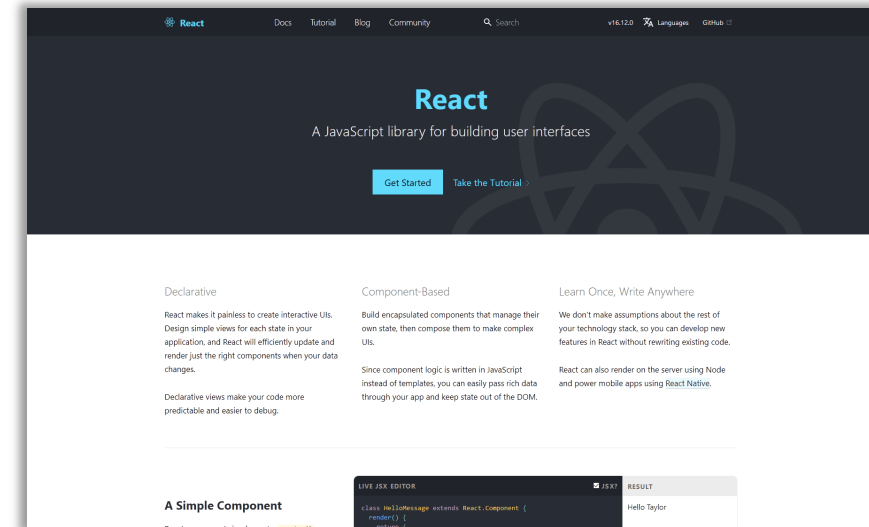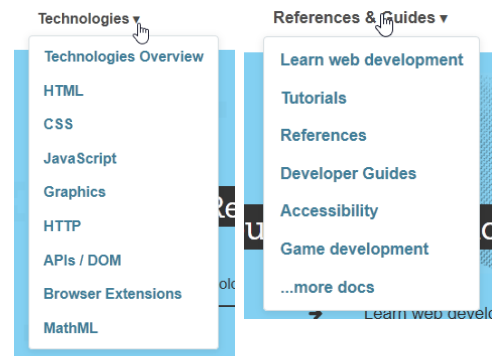


React Library
https://reactjs.org/
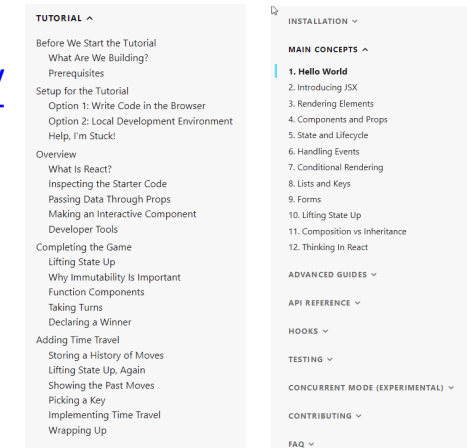
# Resources (books)
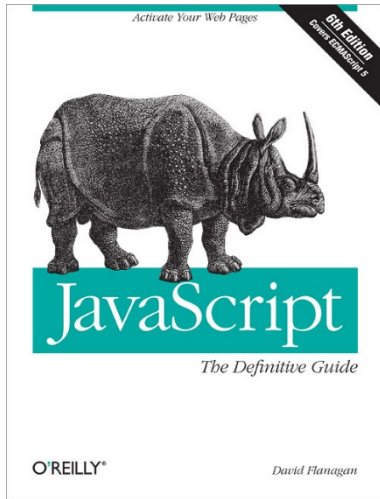
JavaScript: The Definitive
Guide, 6th Edition
By David Flanagan
ISBN 978-0596805524
*Release Date: May 2011*
(not very updated...)
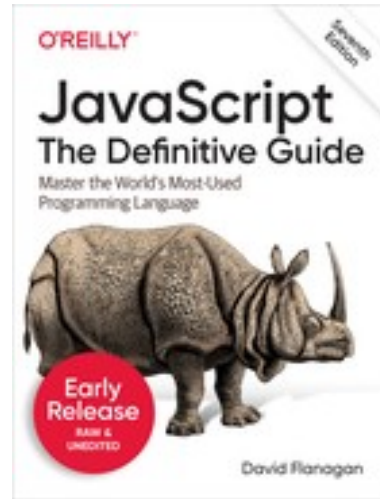
JavaScript: The Definitive
Guide, 7th Edition
By David Flanagan
ISBN 978-1491952023
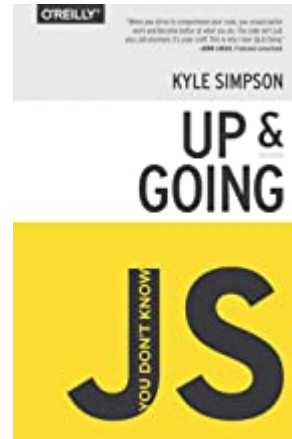*Release Date: July 2020*
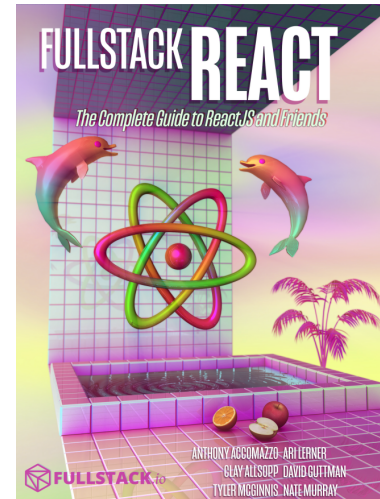
Fullstack React
By Anthony Accomazzo,
Nate Murray, Ari Lerner,
Clay
Allsopp, David Guttman,
and Tyler McGinnis
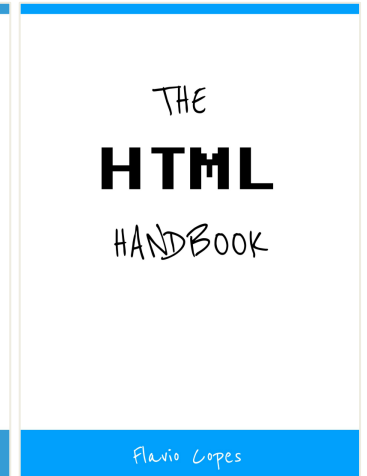https://www.newline.co/fullstack-react
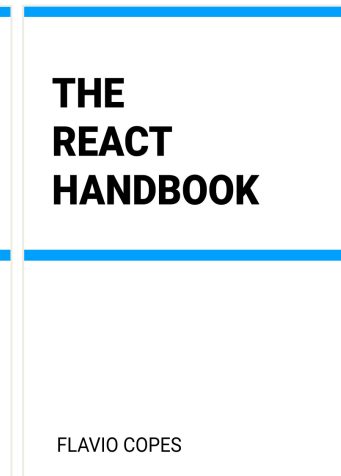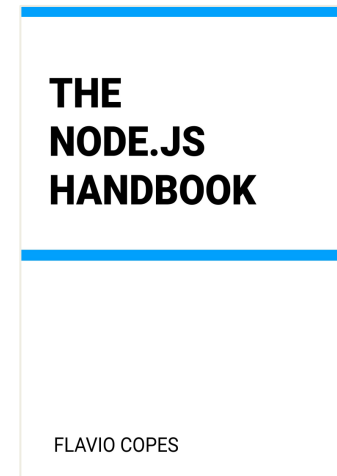*Release: r40 (January 2020)*
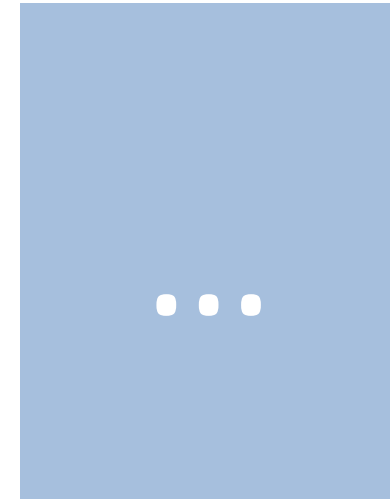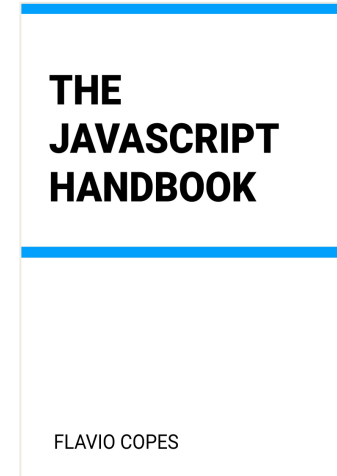
... and many others

# Resources (on-line books)
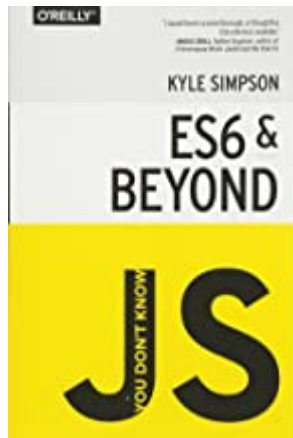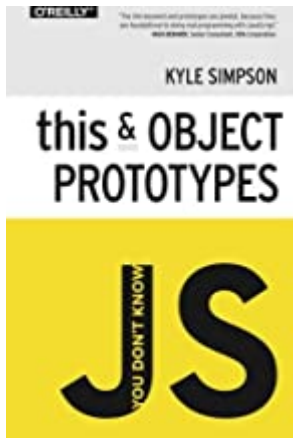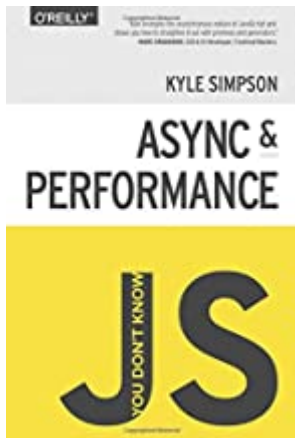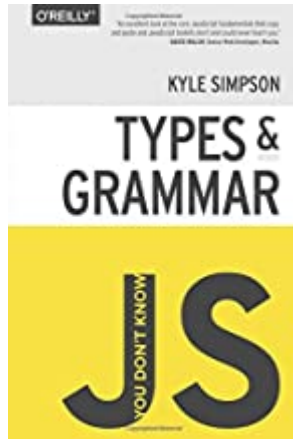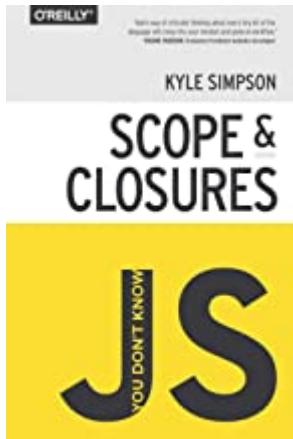
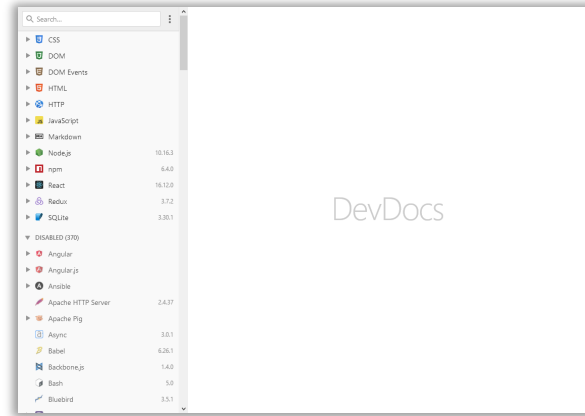You Don't Know JS Yet (book series) - 2nd Edition

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/

# More resources…
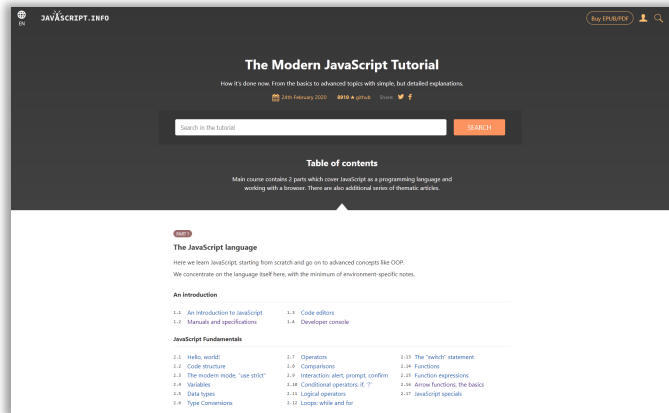


The Modern JavaScript Tutorial
https://javascript.info/



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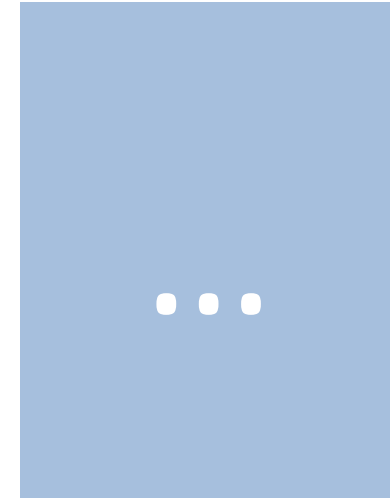


… and many others

# Tools
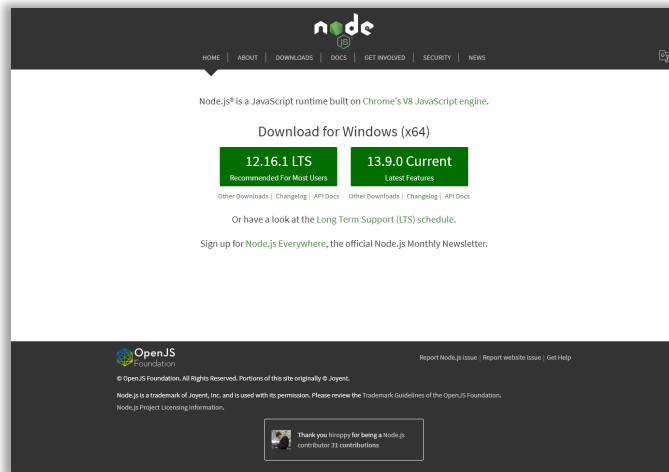


Node.js runtime
Version 14.15 LTS
https://nodejs.org/en/

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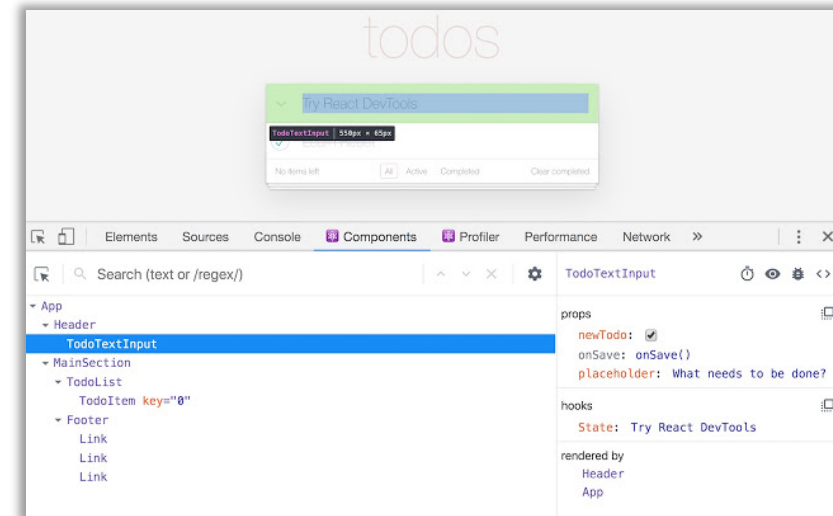


React Developer Tools
*Extension for [Chrome](#) and [Firefox](#)*

# Programming Environment



Visual Studio Code
[https://code.visualstudio.com/](https://code.visualstudio.com/)
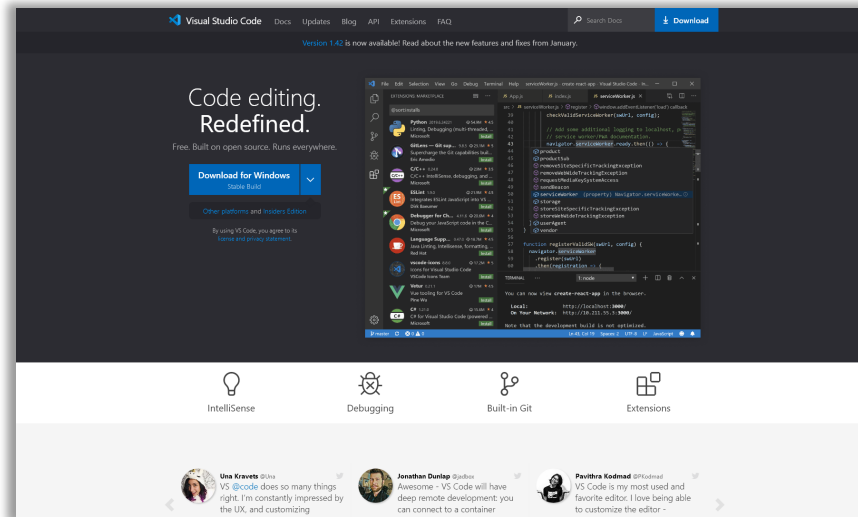
# License

- 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/