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

Applicazioni Web I
Web Applications I

fully aligned

Human Computer Interaction
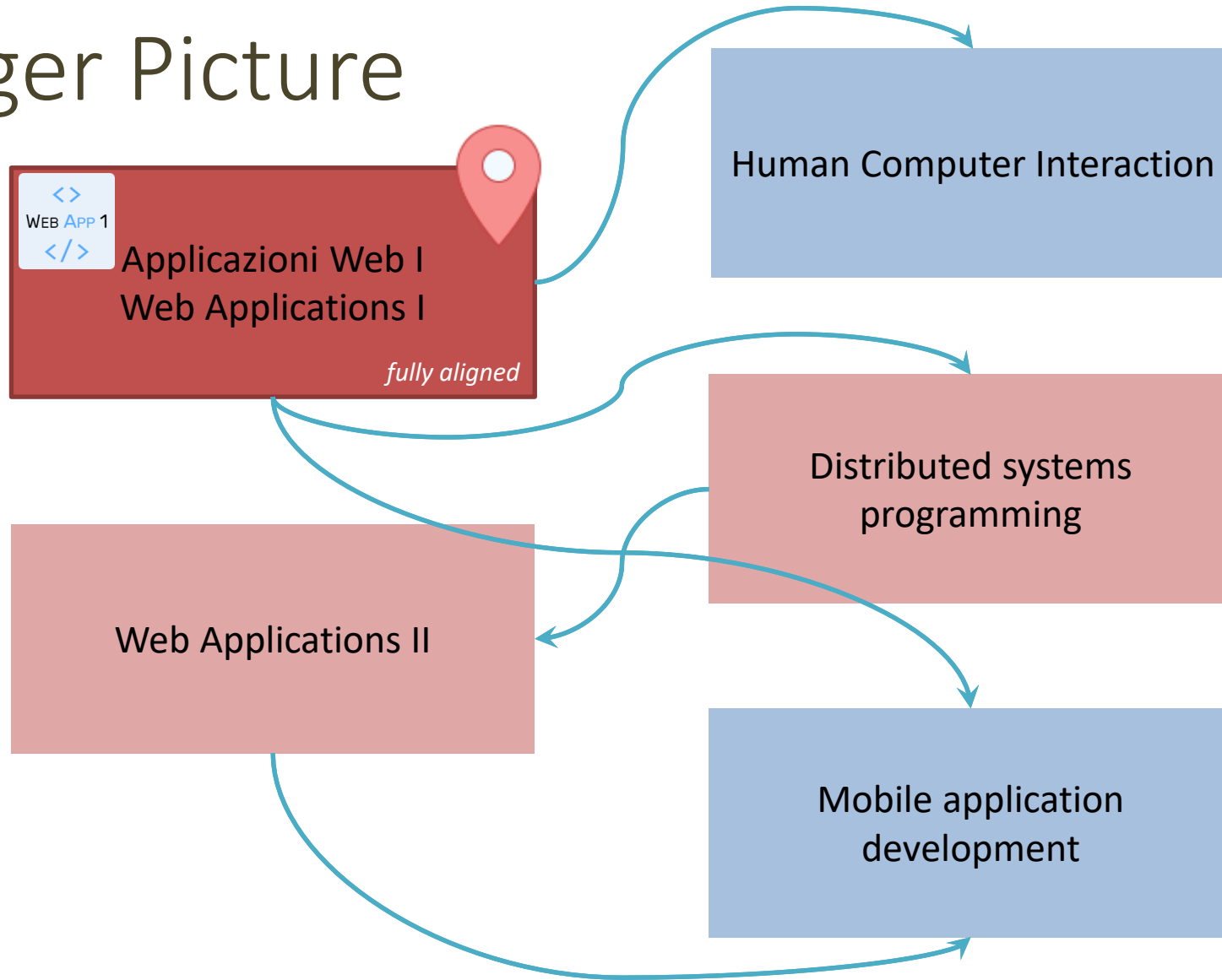
- Usability
- Interface design
- Human centered processes

Distributed systems programming

- Distributed Architectures
- Protocols
- Foundations

Web Applications II

Mobile application development

- 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
3. Intro to Web ; Server-side with Express
4. HTML, CSS, Bootstrap
5. DOM and JS in the browser
6. Intro to React
7. React: props and state
8. React: context, life cycle, forms
9. React router
10. Fetch and client-server interaction (in React)
11. Authentication

Course Organization

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

- Laboratories
  - 1.5 h/week
  - 3 Lab groups (see later for the split)
  - Starting 2nd week

- **Exception**: first week
  - Class instead of Lab

	MO	TU	WE	TH	FR
08:30				R2B	
10:00		R2		R2 B	12 i
11:30		R2			
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 instead of a lecture
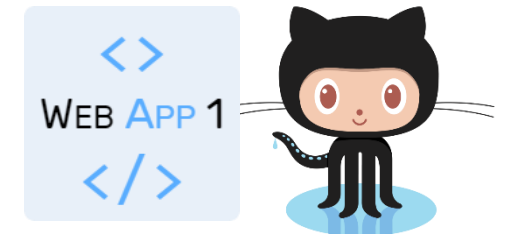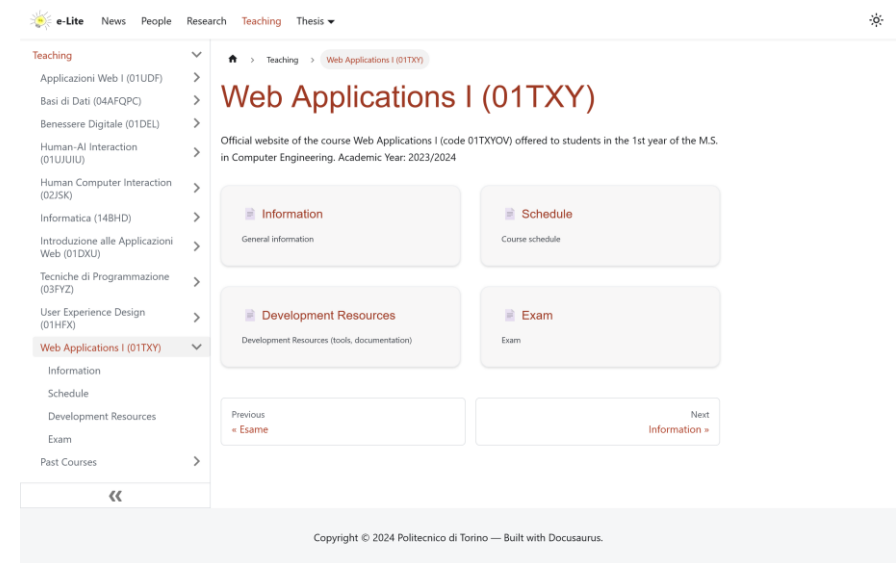 - published well *in advance*

Laboratories

- Starting 14/03/2024
- 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

- 3 slots:
  - Thursday 08:30-10:00 – Room R2B – names A-F – prof. J.P. Saenz
  - Thursday 10:00-11:30 – Room R2B – names G-M – prof. J.P. Saenz
  - Thursday 10:00-11:30 – Room 12i – names N-Z – prof. L. Pezzolla

Learning Material

- Course website – https://bit.ly/polito-wa1
  - Slides (in English)
  - Full schedule
  - Links and supplementary material

- Video lectures (screencasts)
  - YouTube - https://www.youtube.com/playlist?list=PLqRTLlwsxDL9lcLij9lXLxTGQHhKIgSFt
  - Portale della Didattica

- GitHub - https://github.com/polito-webapp1
  - Examples, exercises, labs, exams, …

QR Codes

Course Website

YouTube playlist

Communications

- We will use **Telegram** for the main communications
  - among students, with teachers, etc.
- Announcements, official information, and Q&A
- 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/+qW2RxFD1RrxiNGQ0
  - «Mandatory» participation in the group
- Emails can be an **alternative** for slower, more articulated, and private individual communications

Exam: Two Parts

1. **Project development** (up to 26 points)

    – Individual

    – Starting from shared requirements

    – 20 days of time – submit by 23:59, on the day before the official exam date

2. **Oral discussion** (up to 4 points)

    – individual <u>and</u> mandatory – in person (no on-line exams)

    – "live" correction and discussion of the submitted project, approx. 30 minutes

    – when: the official exam day (or starting from that day)

Exam: Score and Process

- Project development + oral discussion: up to 30 points
- Up to 2 extra points for students whose projects demonstrate a high quality and for the richness and precision of the answers during the discussion

Note: If it emerges that the student does not have mastery of the written code, the exam will be immediately canceled, without a numerical evaluation.

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 <u>each</u> official exam date

How

- Individually (i.e., not in group)
- Using GitHub Classroom
  - commit + push your project
  - strict submission procedure
- Teacher's Evaluation
  - running the application on the teacher's laptop
  - examining the code

Project evaluation criteria

- Correct and complete implementation of the specification
  - Functional requirements
  - Non-functional requirements
- Soundness of design choices and implementation choices
- Consistency with standards and good practices
- Quality and clarity of 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
- To discuss design choices and technical choices

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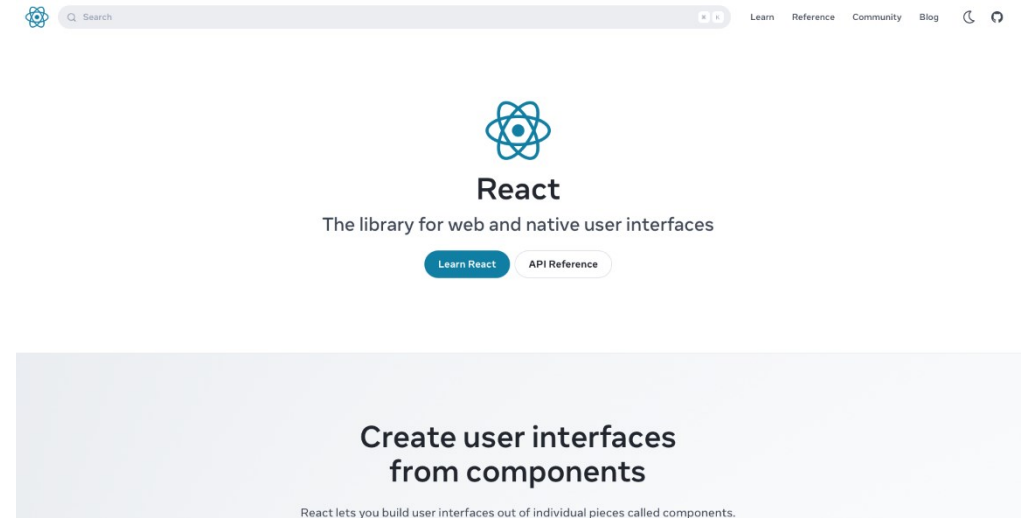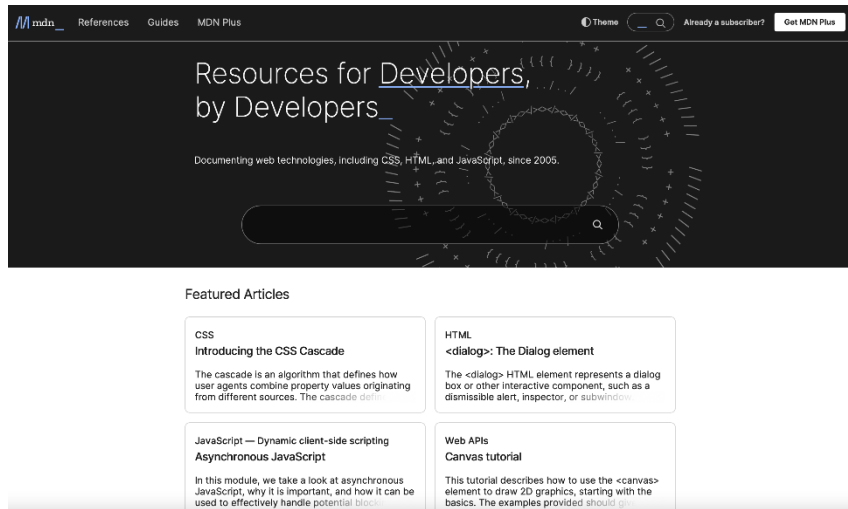
Mozilla Developer Network
(**MDN**)
https://developer.mozilla.org/
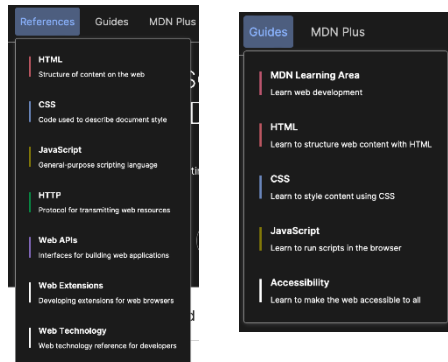
React
https://react.dev
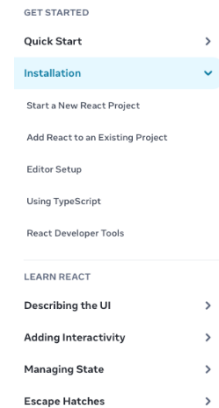
Resources (books)
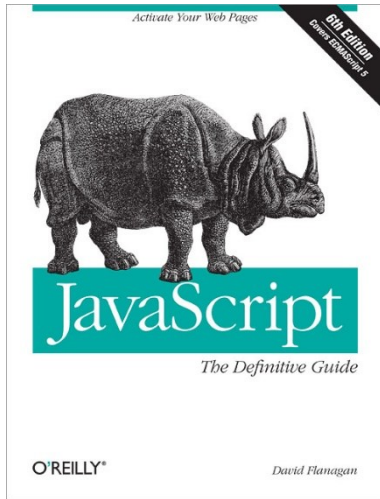
JavaScript: The Definitive Guide,
6th Edition
By David Flanagan
ISBN 978-0596805524
Release Date: May 2011
(not very updated…)
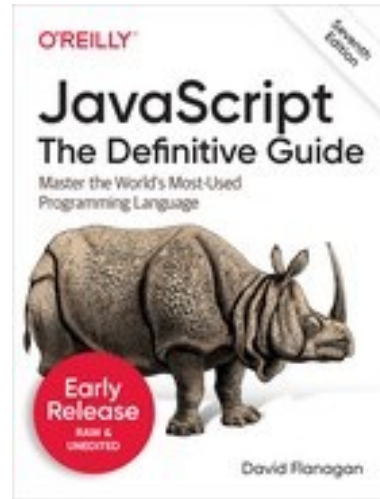
JavaScript: The Definitive Guide,
7th Edition
By David Flanagan
ISBN 978-1491952023
Release Date: July 2020
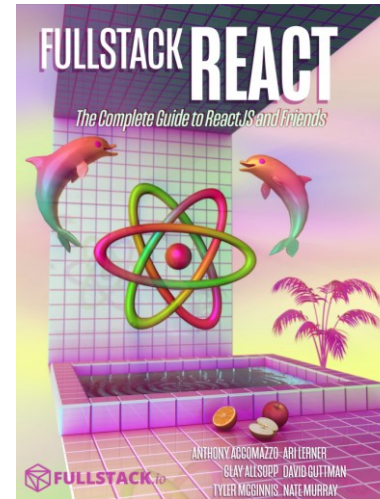
Fullstack React
By Anthony Accomazzo, Nate
Murray, Ari Lerner, Clay
Allsopp, David Guttman, and
Tyler McGinnis
https://www.newline.co/fullstack-react
Release: r40 (January 2020)
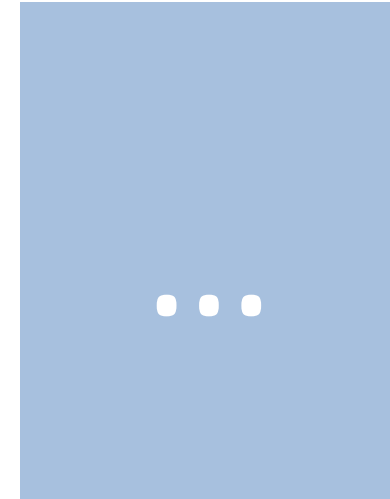
… and many others

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

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

http://speakingjs.com/
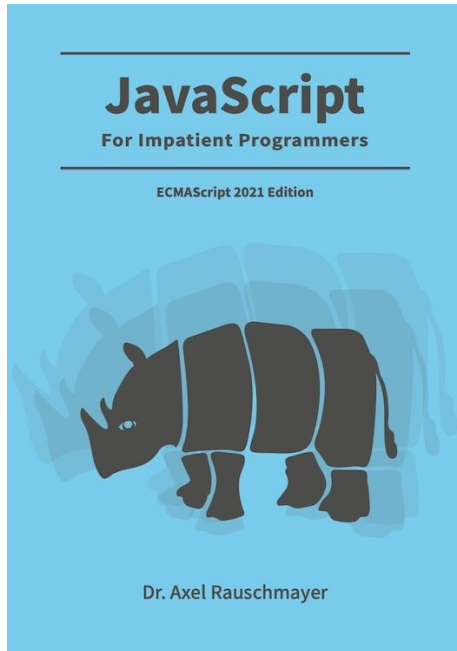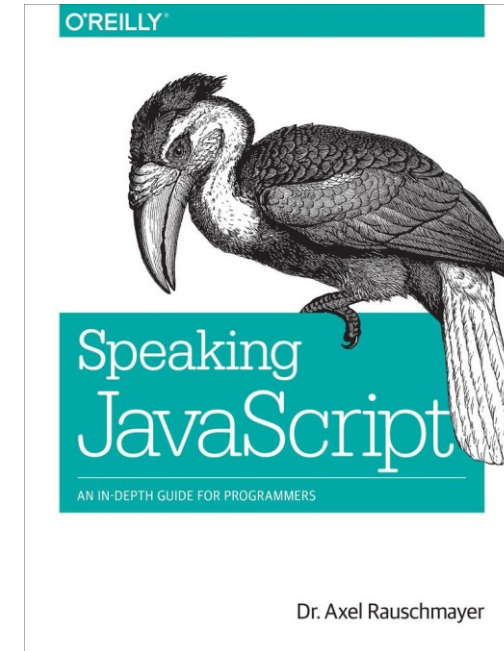
More resources…

The Modern JavaScript Tutorial
https://javascript.info/
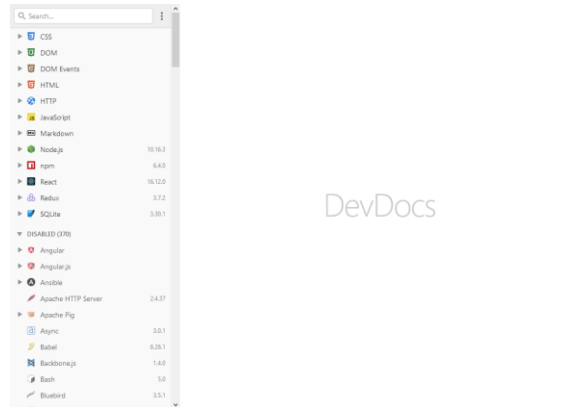
DevDocs: API Documentation
Browser
https://devdocs.io/
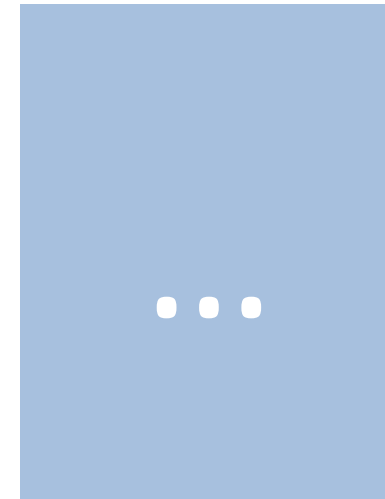
… and many others

Tools
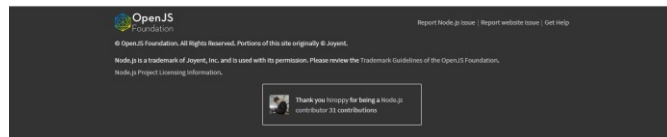
Node.js runtime
Version 20.x LTS
https://nodejs.org/en/
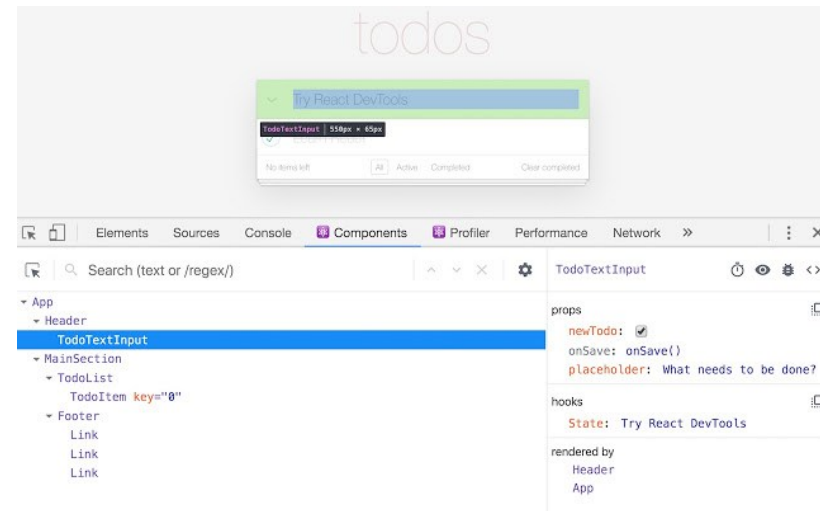
React Developer Tools
Extension for Chrome and Firefox

Programming Environment

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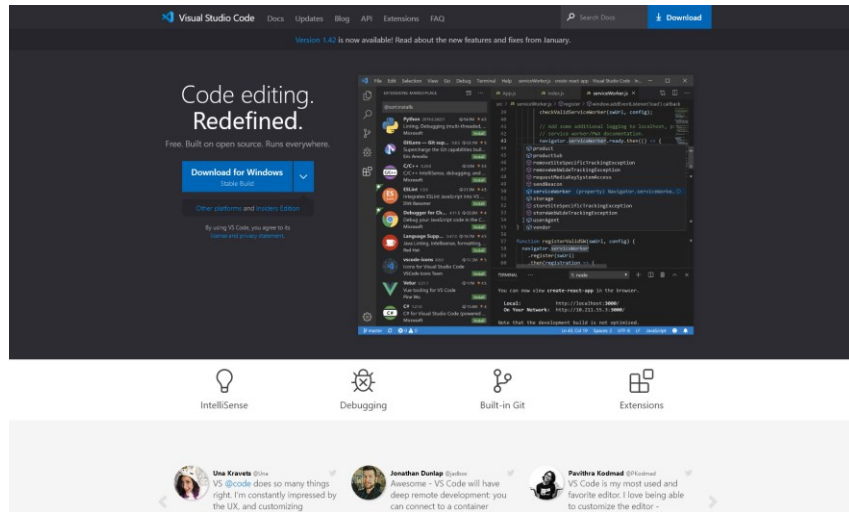
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