

# **IN4MATX 133: User Interface Software**

**Lecture 27:**  
**Wrap-Up**

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# Class notes

- A4 grades are out
  - We rushed a bit to get it out
  - There have been a few mistakes, a lot of compilation issues
- Today is the last lecture :-(
  - Still a few more office hours before A5 is due

# Today's goals

By the end of today, you should be able to...

- Summarize what you learned in IN4MATX 133
- Describe the relevance of the topics to different disciplines in industry
- Fill out the course evaluation!

# **Technology changes quickly**

# Technology changes quickly

IF YOU CAN'T BEAT 'EM, JOIN 'EM —

## Report: Microsoft is scrapping Edge, switching to just another Chrome clone

The move would further cement the desktop browser monoculture.

PETER BRIGHT - 12/4/2018, 9:25 AM



Credit: Future

[Enlarge](#)

123

Windows Central [reports](#) that Microsoft is planning to replace its Edge browser, which uses Microsoft's own EdgeHTML rendering engine and Chakra JavaScript engine, with a new browser built on Chromium, the open source counterpart to Google's Chrome. The new browser has the codename Anaheim.

<https://arstechnica.com/gadgets/2018/12/report-microsoft-is-scrapping-edge-switching-to-just-another-chrome-clone/>

# Technology changes quickly

- Microsoft Edge did not achieve a significant market share
- Their new browser will use the same HTML and JavaScript engines as Chrome
  - Reduces development cost for Microsoft
  - More compatibility makes browser's lives easier

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# Technology changes quickly

- Weird implications for the HTML and CSS standards (by W3C)
  - New features (e.g. a new CSS property) must have a few independent implementations before they can be standardized
  - One fewer company is now providing an implementation
  - Apple (Safari) isn't interested, so W3C will have to rely heavily on Mozilla (Firefox)

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# Technology changes quickly

FUCHSIA BEGINNINGS? —

## Google bridges Android and iOS development with Flutter 1.0

Google's *other* mobile SDK is deemed ready for prime time.

RON AMADEO - 12/4/2018, 9:20 AM



# Flutter

[Enlarge](#)



Today Google is launching Flutter 1.0, the first stable release of its open source, cross-platform UI toolkit and SDK. Flutter lets developers share a single code base across Android and iOS apps, with a focus on speed and maintaining a native feel. The announcement was made today at Google's [Flutter Live](#) conference in London—a show dedicated entirely to the launch of Google's new developer track.



<https://arstechnica.com/gadgets/2018/12/google-bridges-android-and-ios-development-with-flutter-1-0/>

# Technology changes quickly

- A hybrid framework for building Android and iOS apps
- Written in Dart, an object-oriented language Google has been pushing
  - Downside: new language...
- Can export to JavaScript as well
- Maybe it can access native resources more easily than Ionic

FUCHSIA BEGINNINGS? —

## Google bridges Android and iOS development with Flutter 1.0

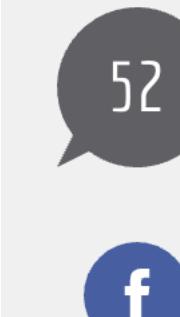
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# **Take away messages from the course**

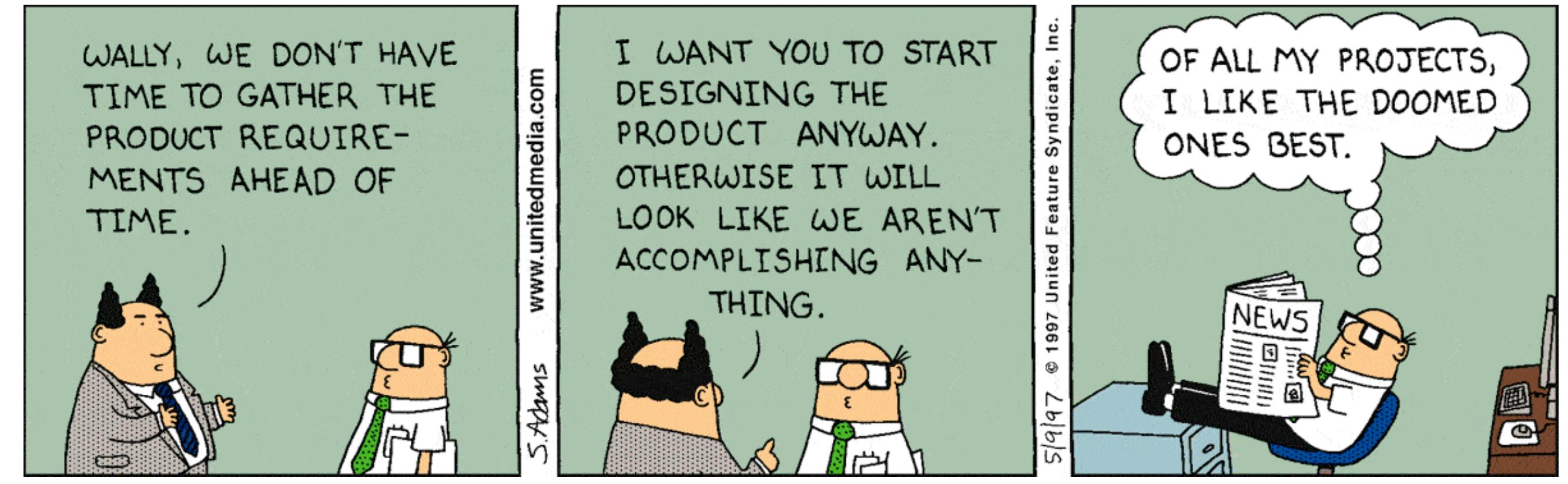
# Search before you build

- Do not reinvent the wheel!
- Use interfaces, algorithms, animations, etc. that have been created by other people



# Build with purpose

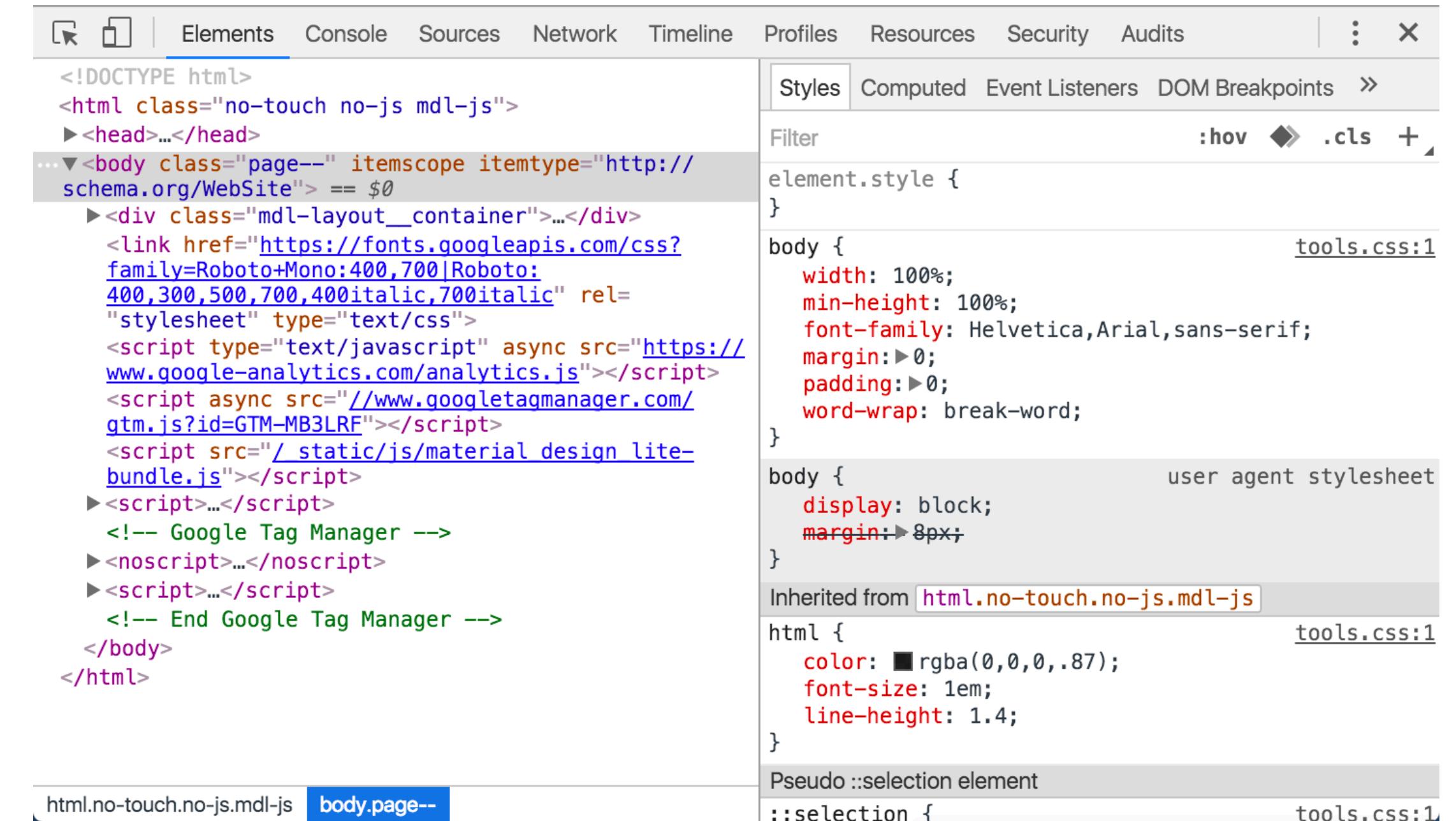
- Before you build, make sure the problem is actually worth solving
- Use services, data, etc. provided by others



<https://dilbert.com/strip/1997-05-09>

# Build by example

- Learn from others
- Read source code on webpages, GitHub, StackOverflow
- Use the element inspector in your browser to see someone's design or implementation



The screenshot shows the 'Elements' tab of a browser's developer tools. A specific body element is selected in the DOM tree. The right panel displays the CSS styles for this element, organized into several style sheets:

- `element.style { }` (tools.css:1)
- `body { width: 100%; min-height: 100%; font-family: Helvetica, Arial, sans-serif; margin: 0; padding: 0; word-wrap: break-word; }` (tools.css:1)
- `body { display: block; margin: 8px; }` (user agent stylesheet)
- `Inherited from html.no-touch.no-js.mdl-js` (tools.css:1)  
`html { color: #rgba(0,0,0,.87); font-size: 1em; line-height: 1.4; }`
- `Pseudo ::selection element` (tools.css:1)  
`::selection { }`

The DOM tree shows the following structure:

```
<!DOCTYPE html>
<html class="no-touch no-js mdl-js">
  <head>...</head>
  ...<body class="page-- itemscope itemtype="http://schema.org/WebSite"> == $0
    <div class="mdl-layout__container">...</div>
    <link href="https://fonts.googleapis.com/css?family=Roboto+Mono:400,700|Roboto:400,300,500,700,400italic,700italic" rel="stylesheet" type="text/css">
    <script type="text/javascript" async src="https://www.google-analytics.com/analytics.js"></script>
    <script async src="//www.googletagmanager.com/gtm.js?id=GTM-MB3LRF"></script>
    <script src="/_static/js/material_design_lite_bundle.js"></script>
    <script>...</script>
    <!-- Google Tag Manager -->
    <noscript>...</noscript>
    <script>...</script>
    <!-- End Google Tag Manager -->
  </body>
</html>
```

# Build for accessibility

- Keep in mind who you are designing for!
- Make sure your app works for:
  - All users
  - All browsers
  - All devices



# Build with caution

- Use version control!
- Test while you build
- Iteratively refine and debug



**GitHub**

# Build on a solid foundation

- A new framework will come out next year
  - Or next month or next week
- But some fundamental principles unite them all
  - Separating interface from data and interaction, for example

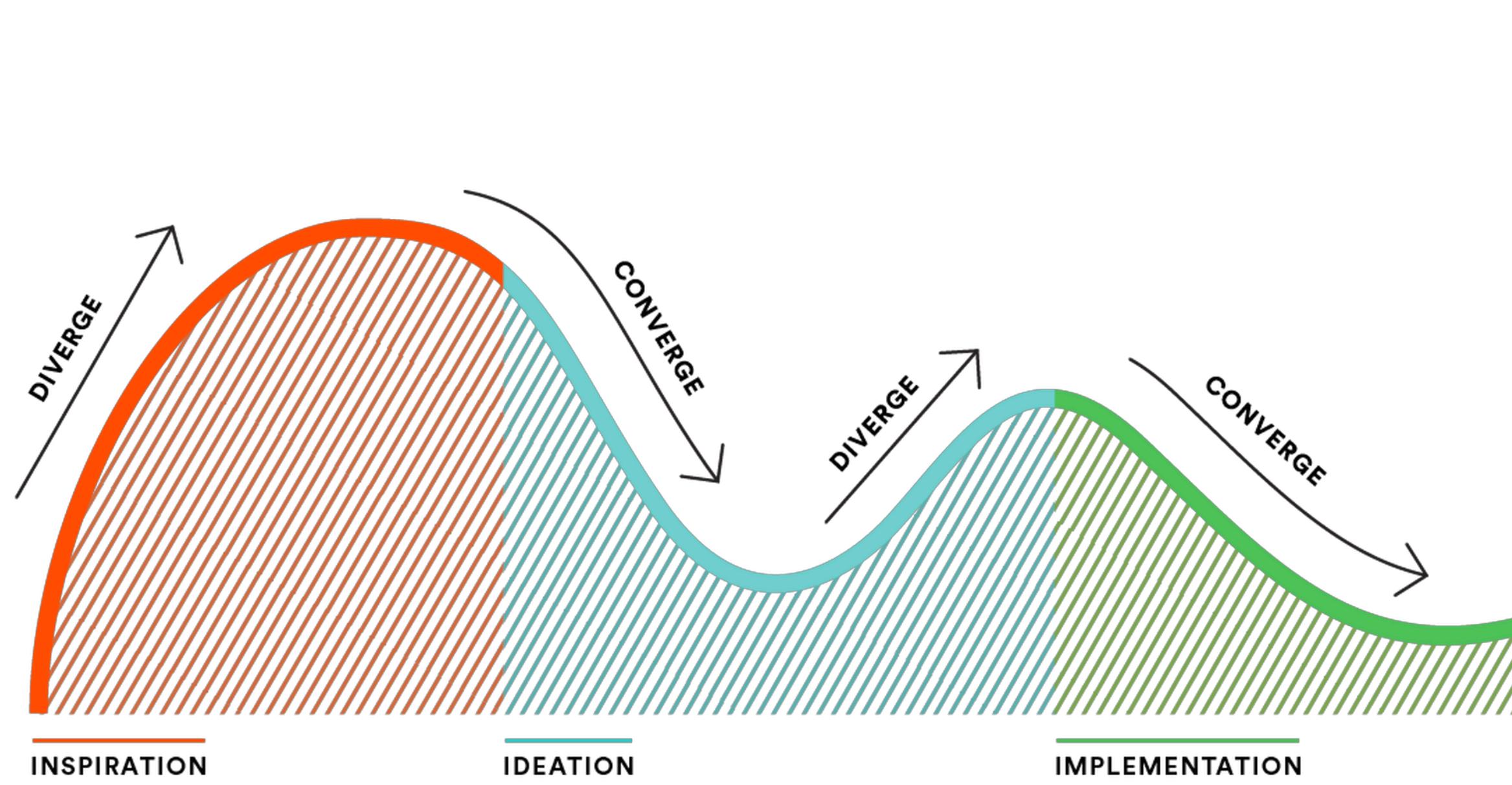


# Take away messages

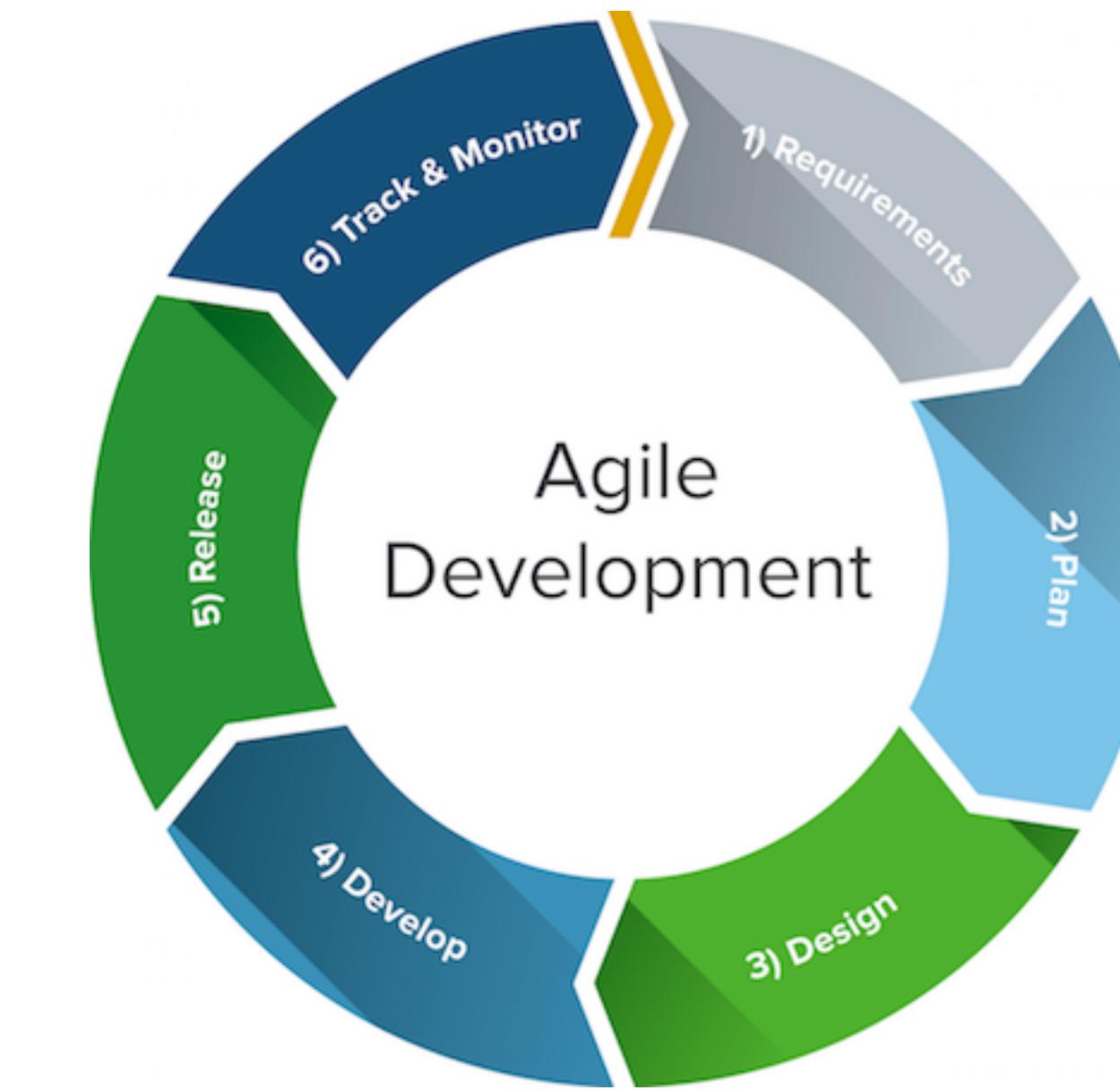
- Search before you build
- Build with purpose
- Build by example
- Build for accessibility
- Build with caution
- Build on a solid foundation

# **Applying this course in practice**

# Product design process

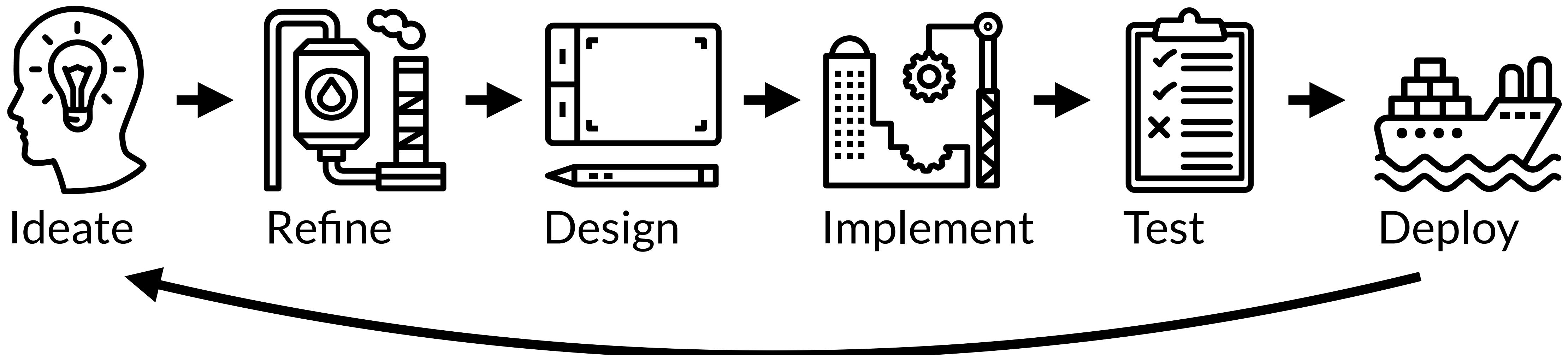


Human-Centered Design, IDEO



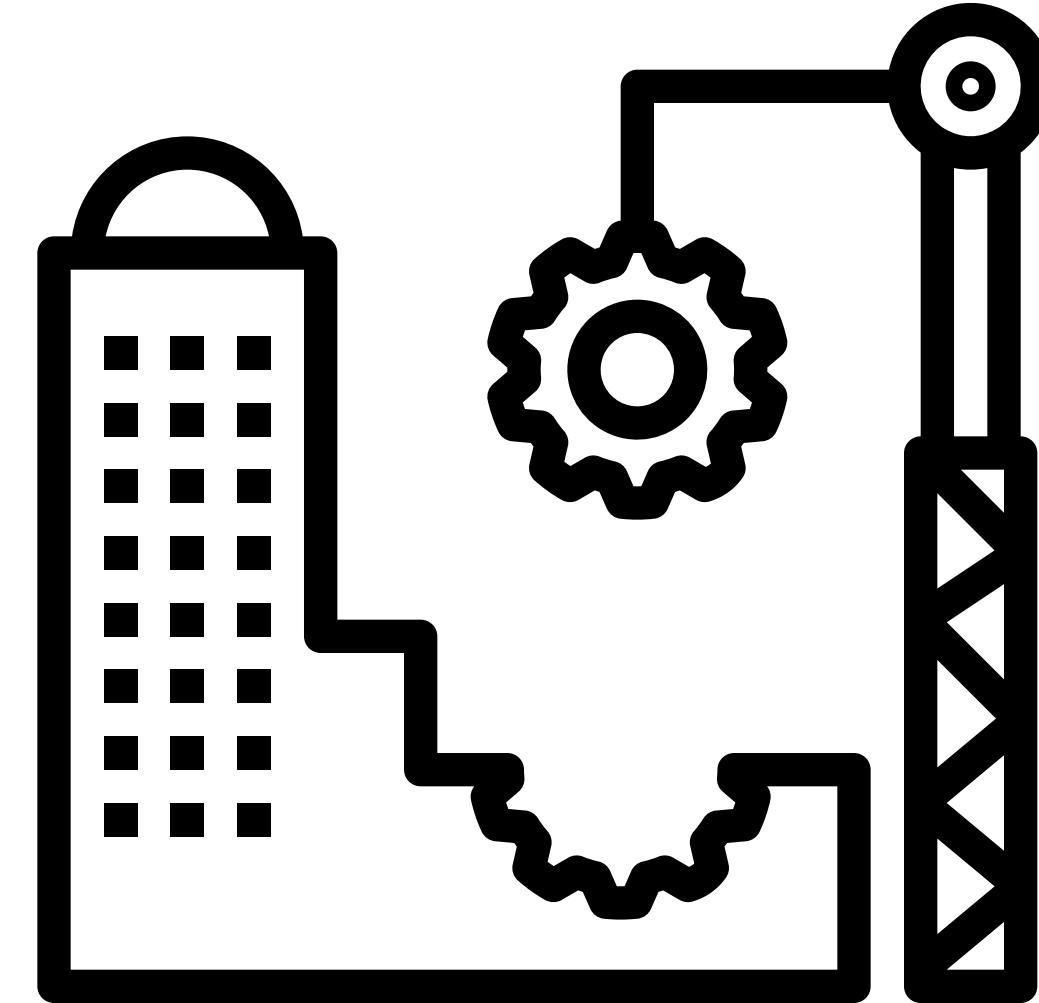
Agile Development, Agile Manifesto

# Product design process, simplified



# User interface implementation

- Has the power to turn ideas into reality
- Often dictates design decisions and timelines, for better or for worse
- Either you will be implementing, or you will need to communicate with your colleagues who are



**What job might you get  
when you graduate?**

# Some job options

- User experience designer
- User experience researcher
- Front-end software engineer
- Back-end software engineer
- Academic researcher (graduate student)
- Software consultant
- Something unrelated to technology
- ... others?

# Question



What job do you think you want when you graduate?

- A UX researcher or designer
- B Frontend software developer
- C Backend software developer
- D Something else (academic? consultant? Unrelated to technology?)
- E I'm not sure!

# If you're going into UX, you can now...

- Follow principles of web, mobile, AR design
  - Responsive design! Error prevention! Give clear instruction!
- Achieve conversational knowledge of web and mobile programming
  - Be able to understand what tasks are easy and what are hard
  - And understand when a developer is BSing you about how long something will take
- Style a webpage
  - Use CSS and SASS to change a design and even add animations

# Front-end software engineering...

- Build a webpage in plain HTML
  - Make it responsive with Bootstrap
- Use a framework to build a richer application
  - Angular for a web frontend
  - Ionic for a mobile frontend
- Style a webpage
  - Use CSS and SASS to change a design and even add animations

# Back-end software engineering...

- Build a web server
  - Allow it to respond to requests from a front-end interface
  - Allow it to make requests to APIs made by other developers
- Follow authentication and authorization protocols
  - Enable users to sign on
- Use a database
  - Data can persist between sessions

# Academic research...

- Explain some key problems in a couple of areas
  - Human performance
  - Mixed reality design
  - Technology after growth
  - Computer supported cooperative work
  - Wearable computing
  - Augmented and virtual reality

# Software consultancy...

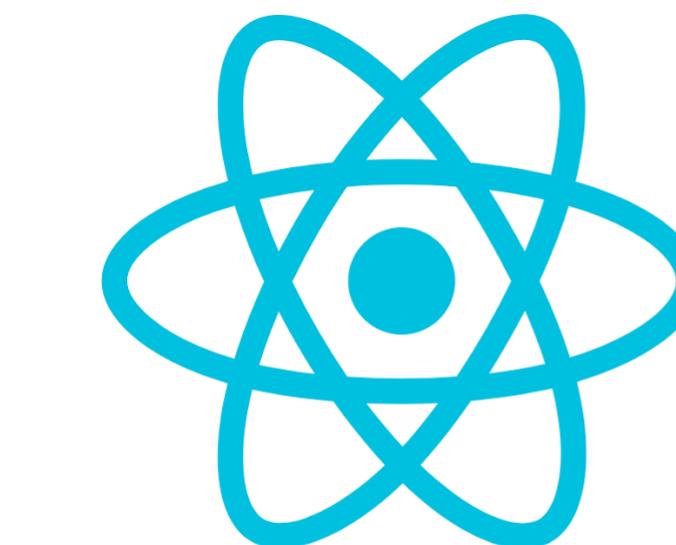
- Process and analyze data
  - Retrieve it from an API
  - Parse and process it to answer your question
- Visualize data
  - Use an appropriate tool for the task

# Something unrelated...

- Make a portfolio to show off your skills
  - Selling yourself is key
- Judge new devices and apps that come along
  - Is this solving a real problem?
  - Is this well designed?

# What is interface implementation today?

Often HTML, CSS, and JavaScript



React JS



Bootstrap



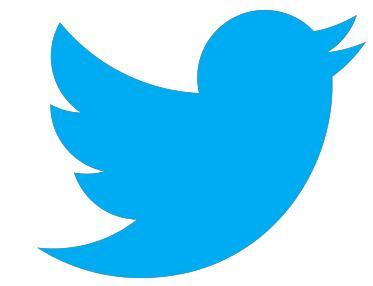
ember

# Assignments

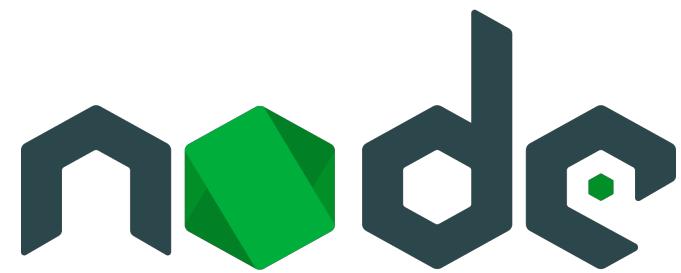
- A1: Personal web portfolio



- A2: Web communication



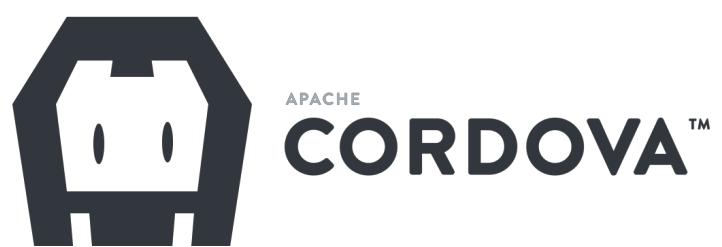
- A3: Client/server and authentication



- A4: Mobile development



- A5: Native resources and databases



# Other skills

- Git and GitHub
- Package management in npm
- SASS
- Visualization in Vega-Lite

# Congratulations!

- We said this class would be challenging
- You have risen to the challenge and worked hard (and still are)
- You have created impressive work as a result

**It's been an honor  
to be able to teach you.**

**I look forward to seeing  
what you do next!**

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