

IN4MATX 133: User Interface Software

Lecture 1:
Introduction & History, Continued
Basics of Web Communication

Announcements

- Apologies. Due to the holiday, there will not be a discussion next Monday.
- In lieu of the absence of two discussions, I will be holding an extended class on Friday (1-3pm)
 - 1-2 will focus on getting started with HTML, CSS and basic web development
 - 2-3 will cover what you would have learned in discussion on Monday
 - Your TA's are available to help!

Today's goals

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

- CONTINUE....Describe how society got to today's ubiquitous computing
- Hypothesize why web technology has become the de-facto tool for interface development
- Describe upcoming course tasks
- Describe the fundamentals of web communication

Three waves of computing



Mainframe
computing



Personal
computing



Ubiquitous
computing

Second wave: personal computing

- First introduced by Xerox
- Xerox Alto, 1973
 - Mouse
 - Chording keyboard
- Xerox Star, 1981
- Xerox models were commercially unsuccessful
 - Still expensive, too few applications



Second wave: personal computing

Xerox Star (1981)



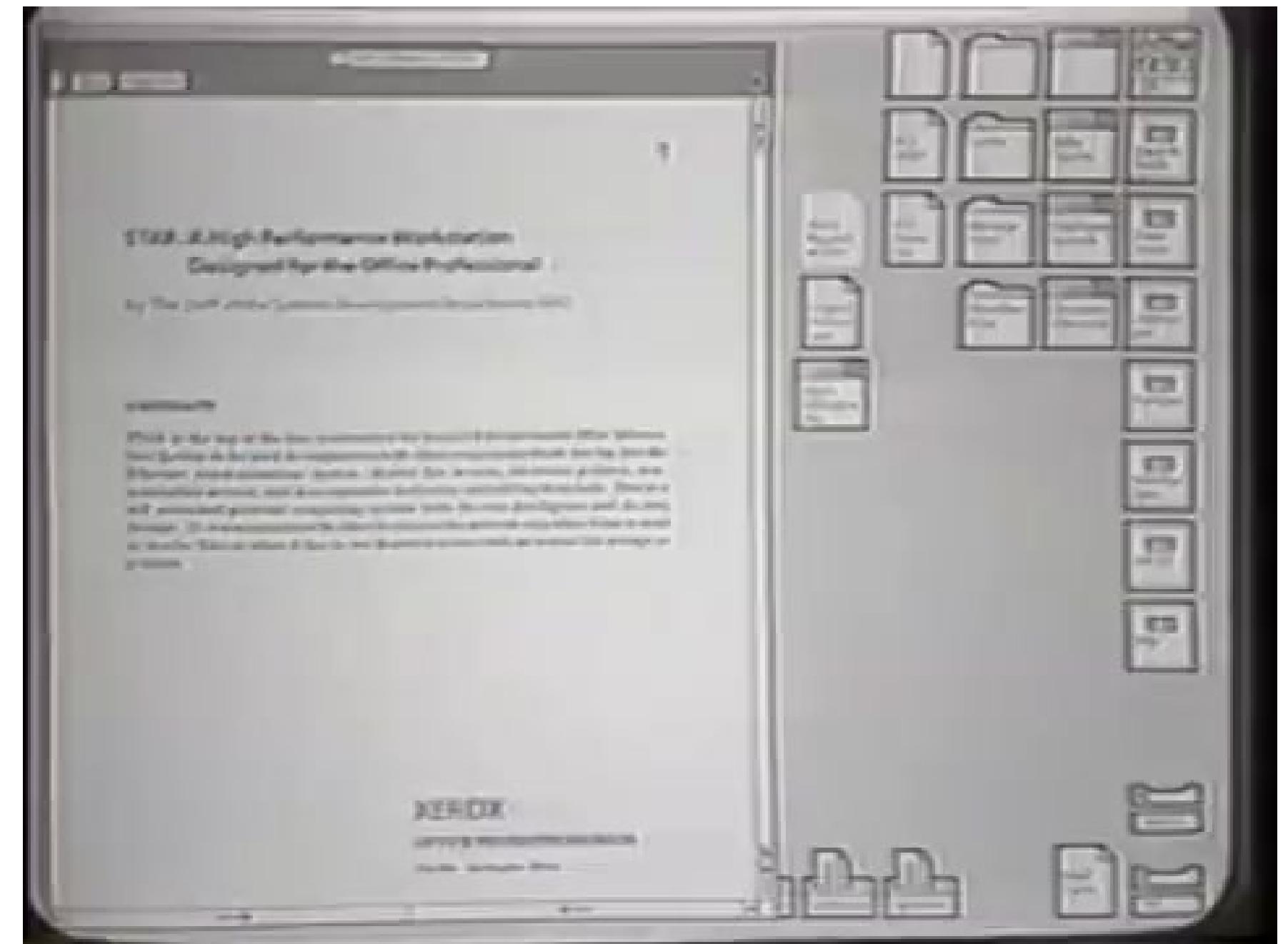
<https://www.youtube.com/watch?v=ODZBL80JPqw>

Did you recognize any interactions that are commonly used today?

Second wave: personal computing

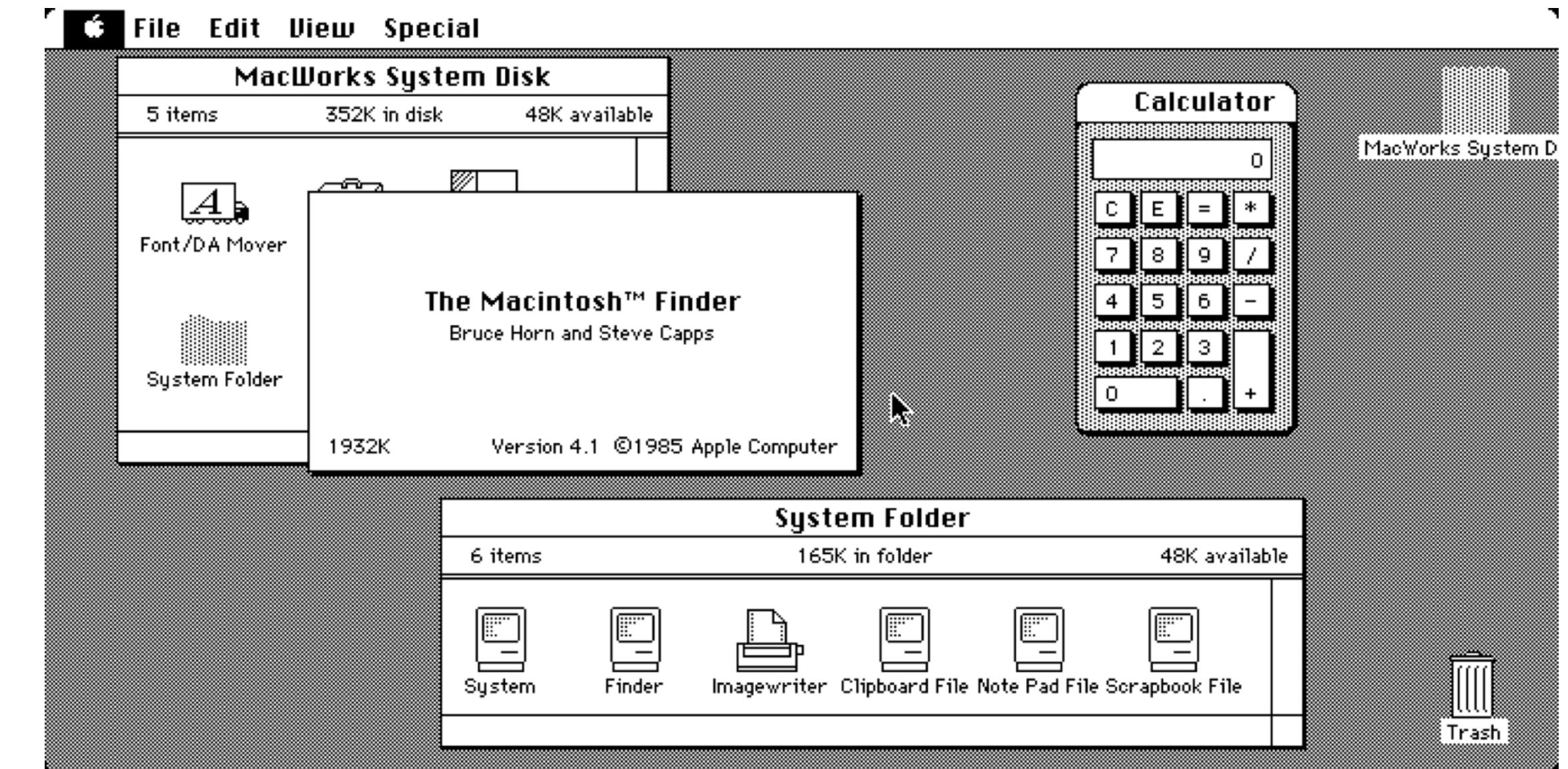
Xerox Star (1981)

- Software running in windows
- Desktop with icons for navigating between files and programs
- Super slow!



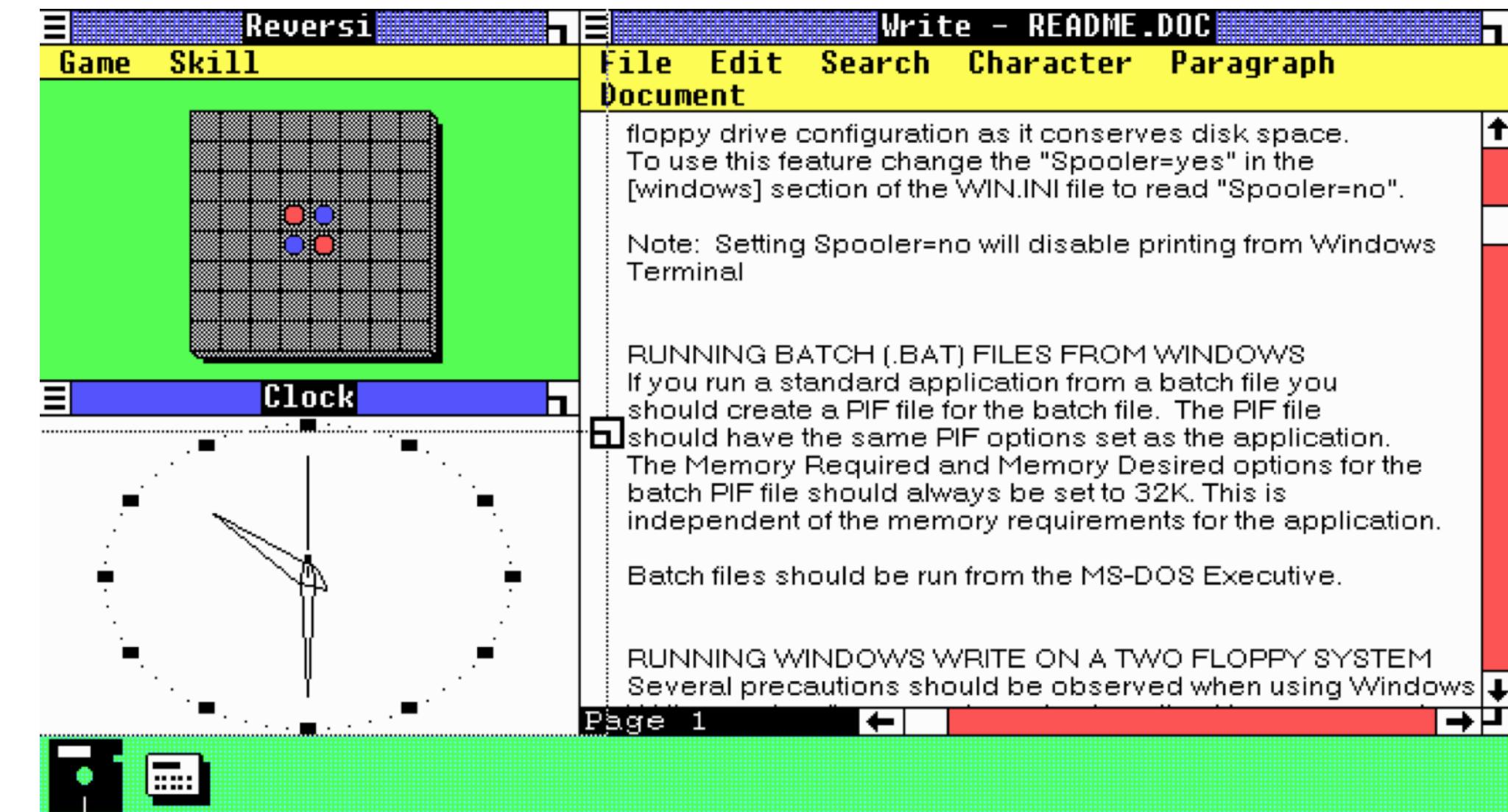
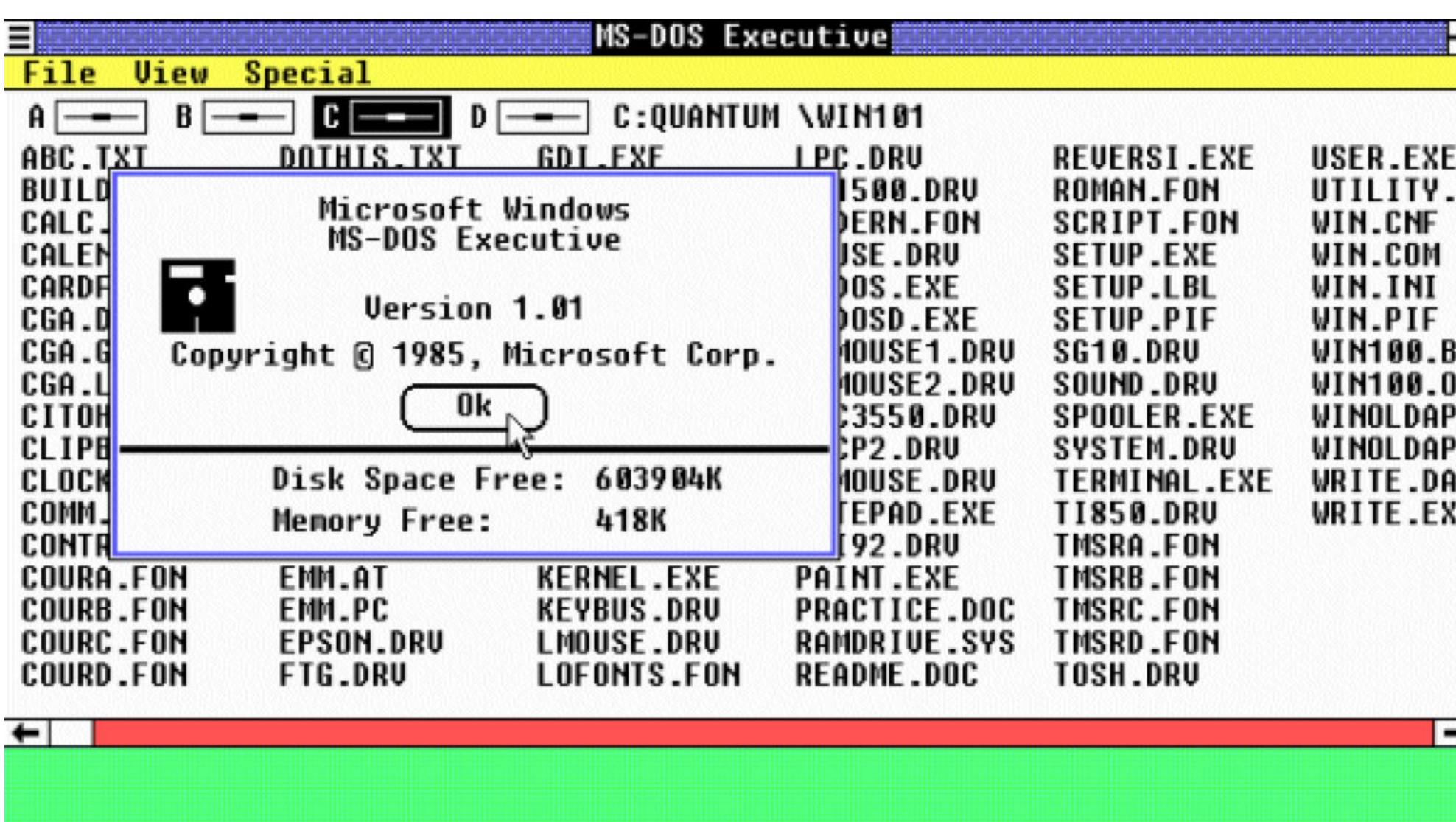
Second wave: personal computing

Macintosh (1984)



Second wave: personal computing

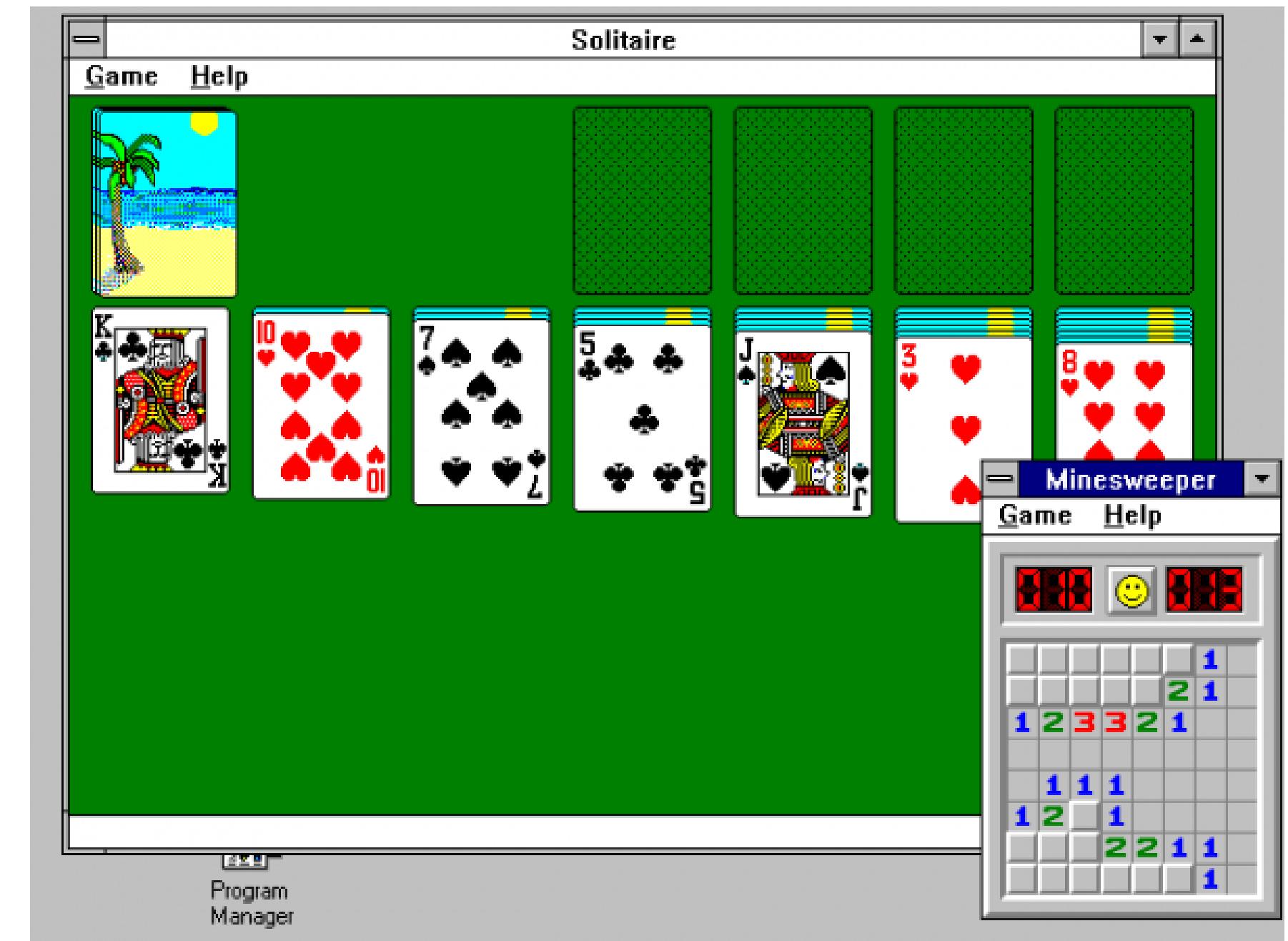
Windows 1.0 (1985)



Second wave: personal computing

Windows 3.0 & 3.1 (1990 & 1992)

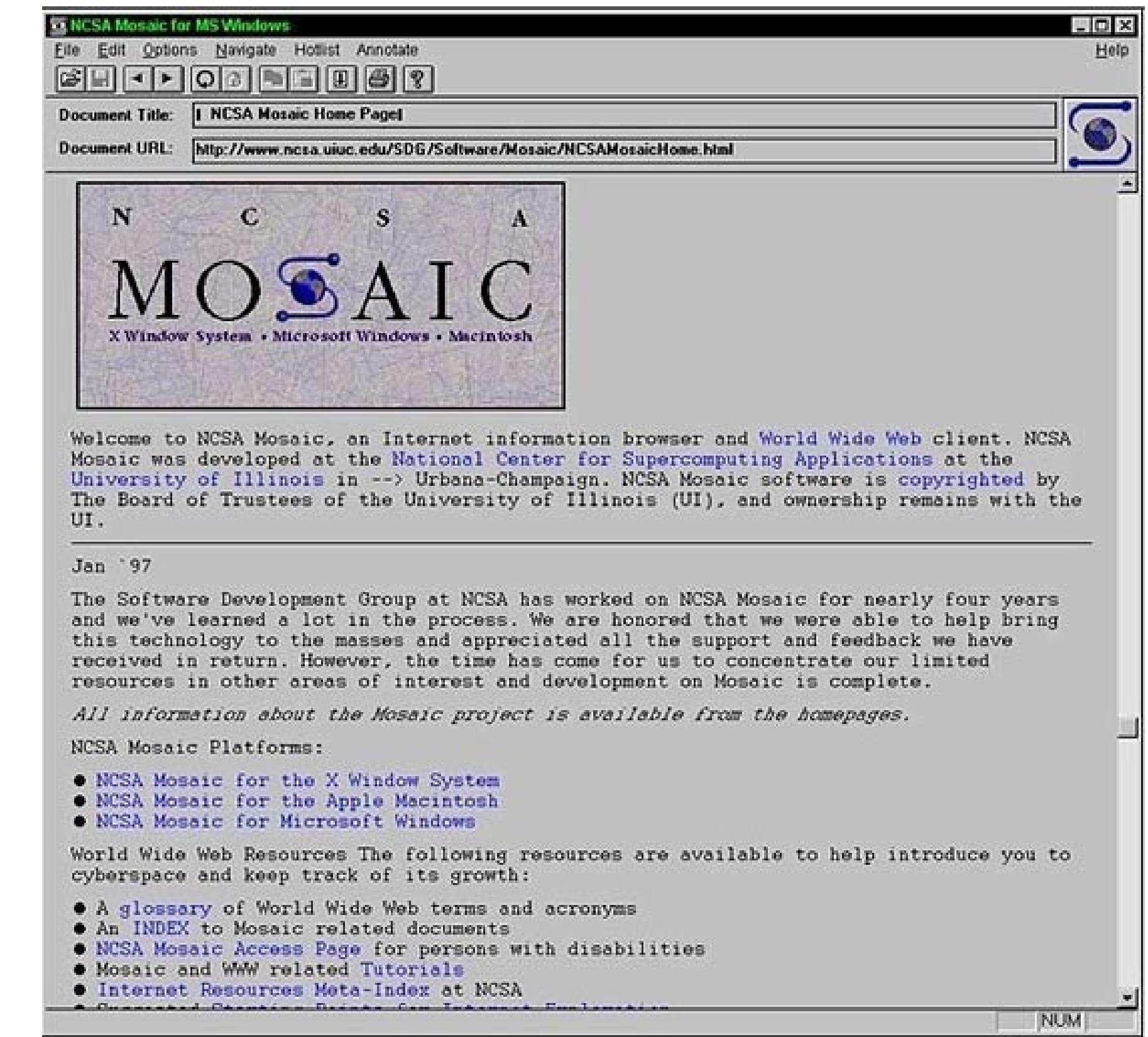
- Windowing became primary
- Added games: Solitaire, Minesweeper, and FreeCell!
 - These were a trick to teach mouse skills



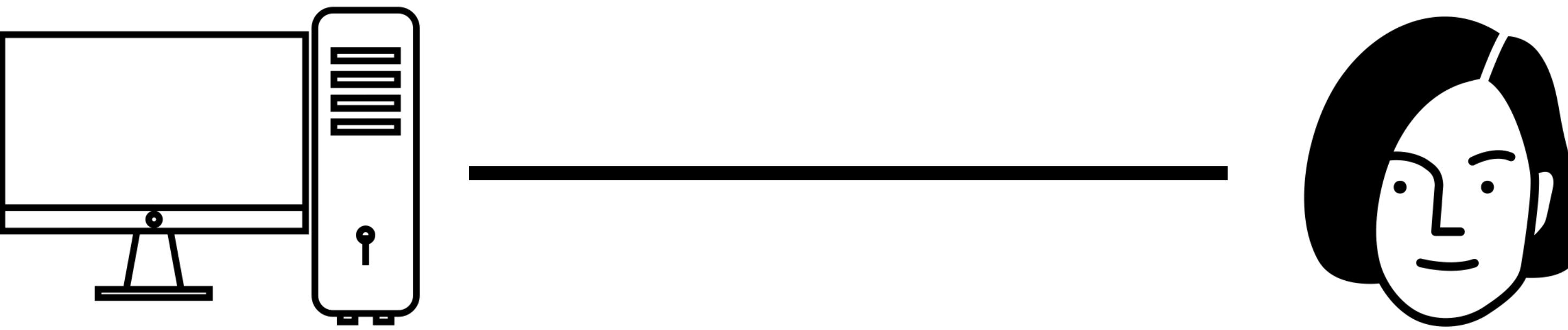
Second wave: personal computing

Mosaic Web Browser (1993)

- Originally for Unix systems, later ported to Mac and Windows
- “First” graphical web browser
- Microsoft IE came in 1995
- Apple didn’t make a browser until Safari in 2003



Second wave: personal computing



“One to one”

Three waves of computing



Mainframe
computing



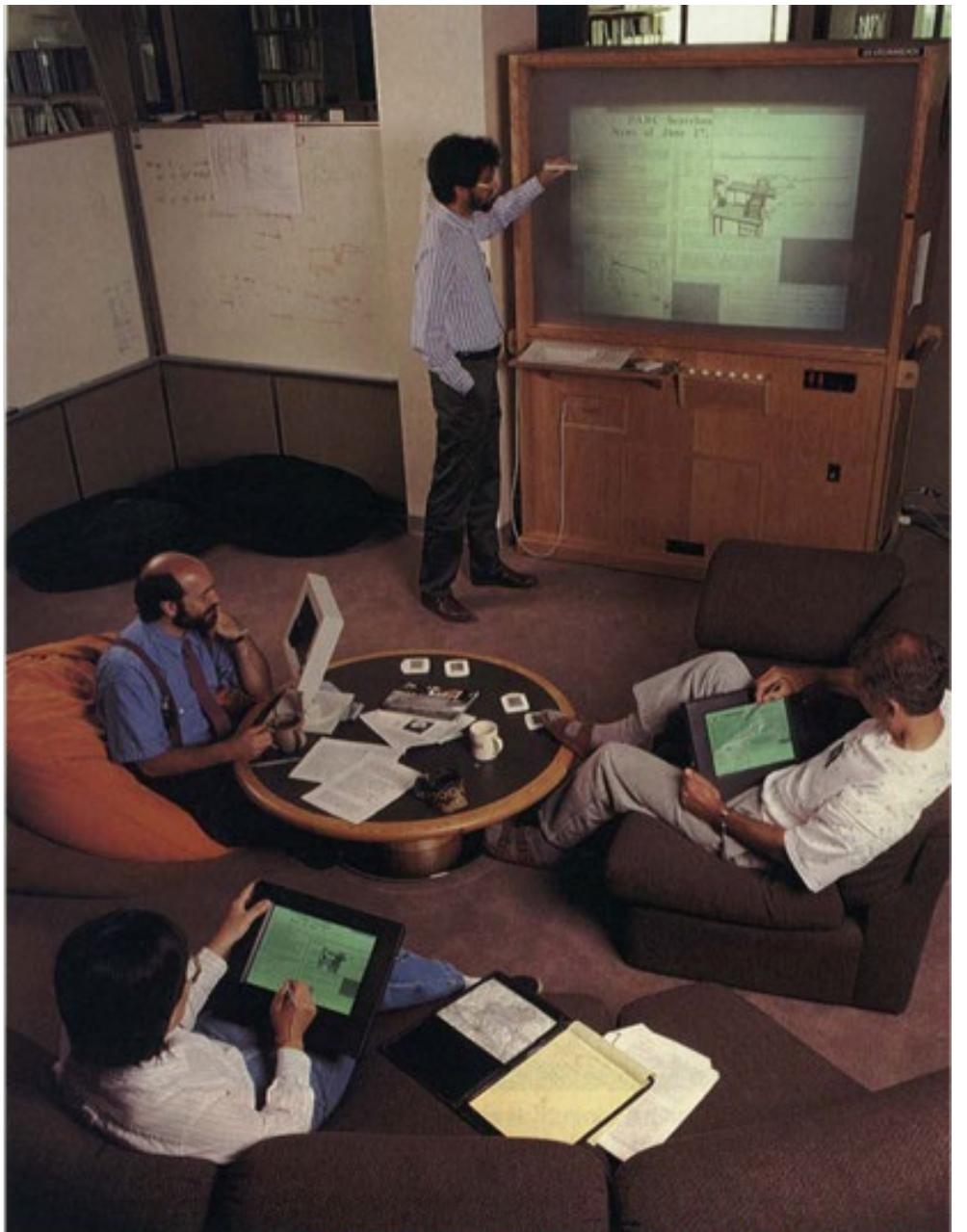
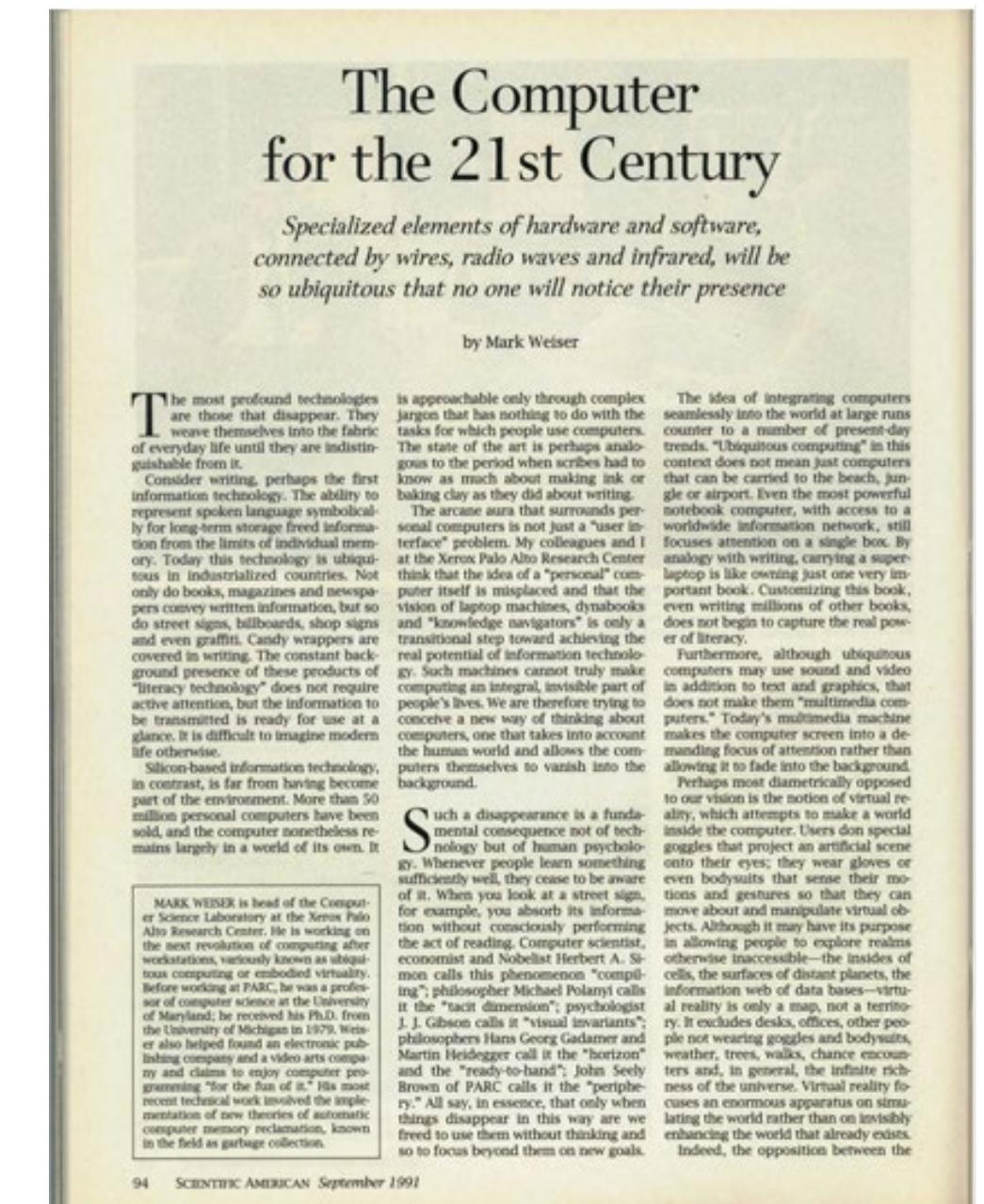
Personal
computing



Ubiquitous
computing

Third wave: ubiquitous computing

- Weiser speculated people would interact with three types of computers
 - Tabs: inch-scale devices, like post-its
 - Pads: foot-scale devices, like paper
 - Boards: yard-scale devices, like whiteboards
- Speculated devices would have shared ownership



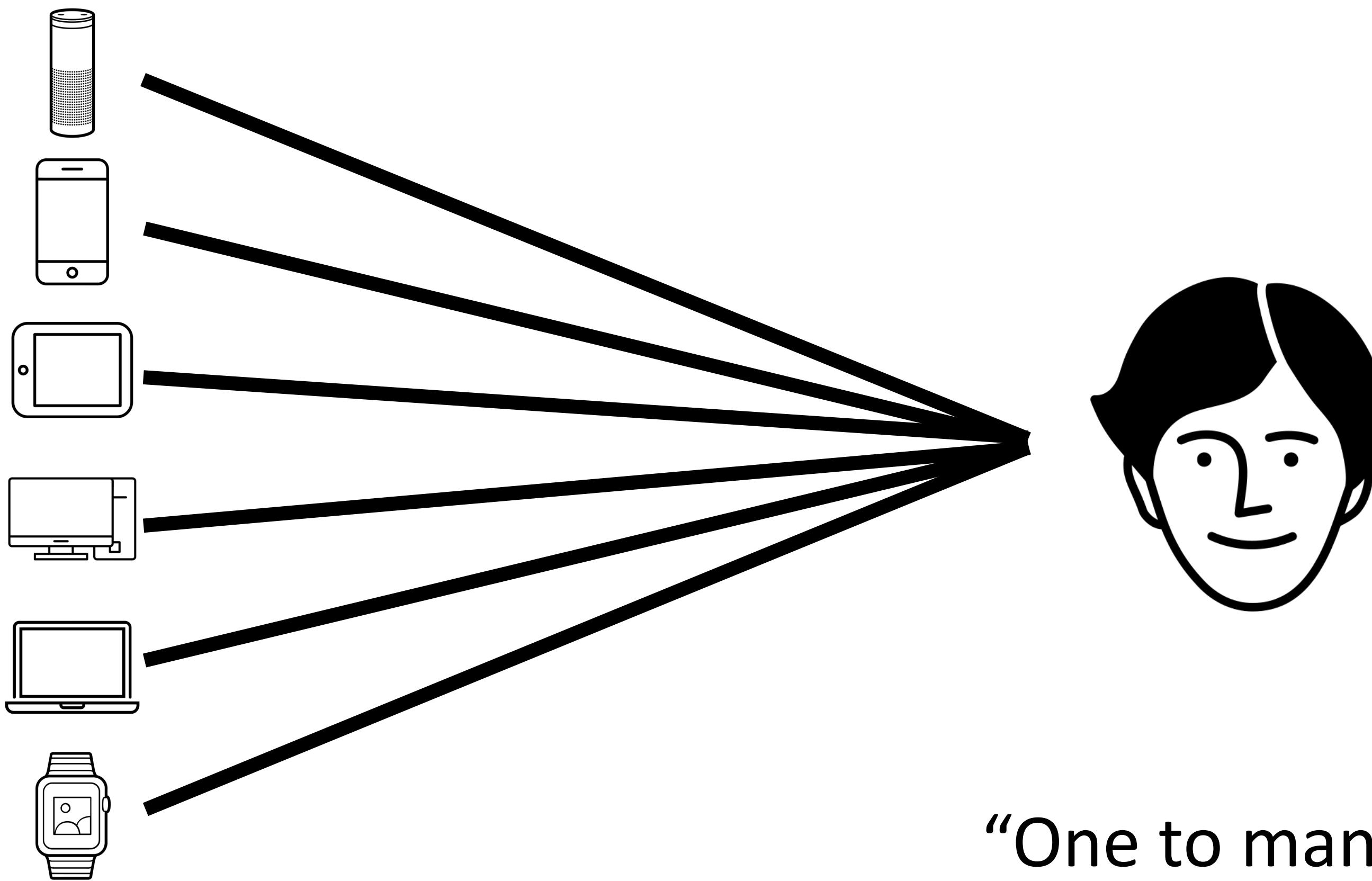
Third wave: ubiquitous computing



Third wave: ubiquitous computing

- Lines up with what we use today, for the most part
 - Tabs = phones and watches
 - Pads = tablets and laptops
 - Boards = interactive projectors? smart TVs? augmented reality?
- Still a strong sense of device ownership

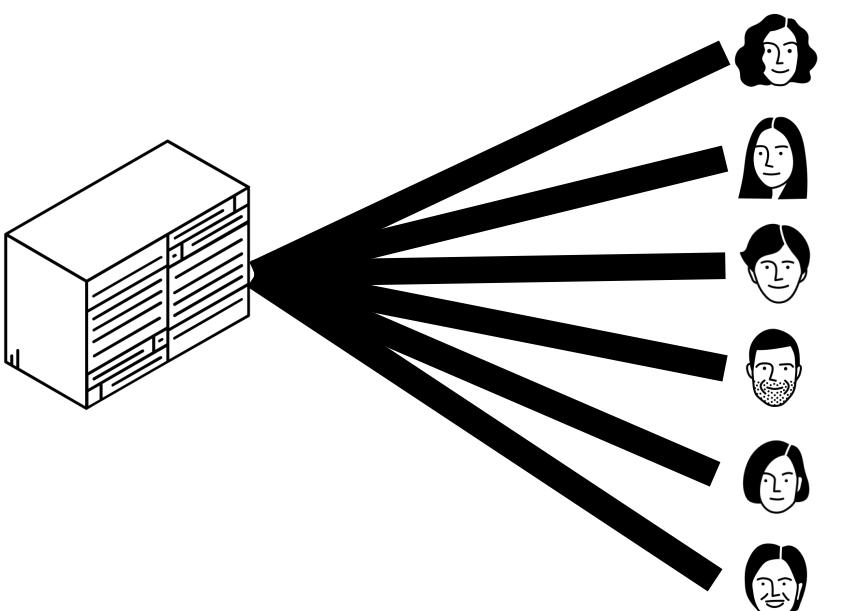
Third wave: ubiquitous computing



Three waves of computing



Mainframe
computing



“Many to one”



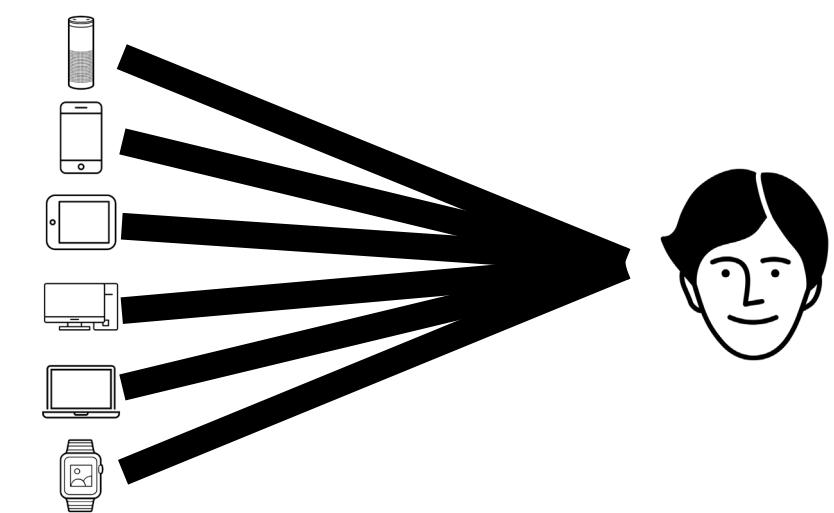
Personal
computing



“One to one”



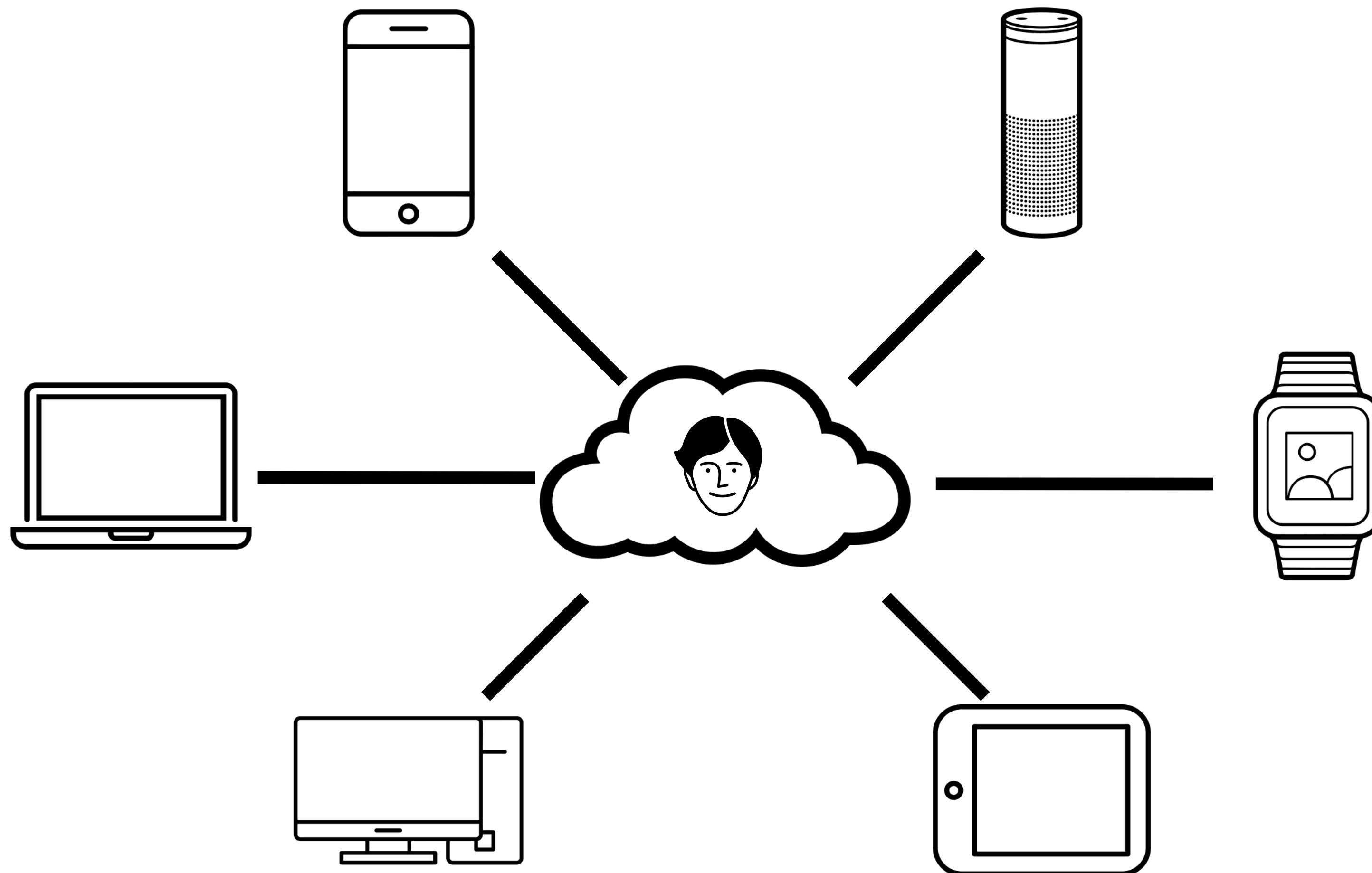
Ubiquitous
computing



“One to many”

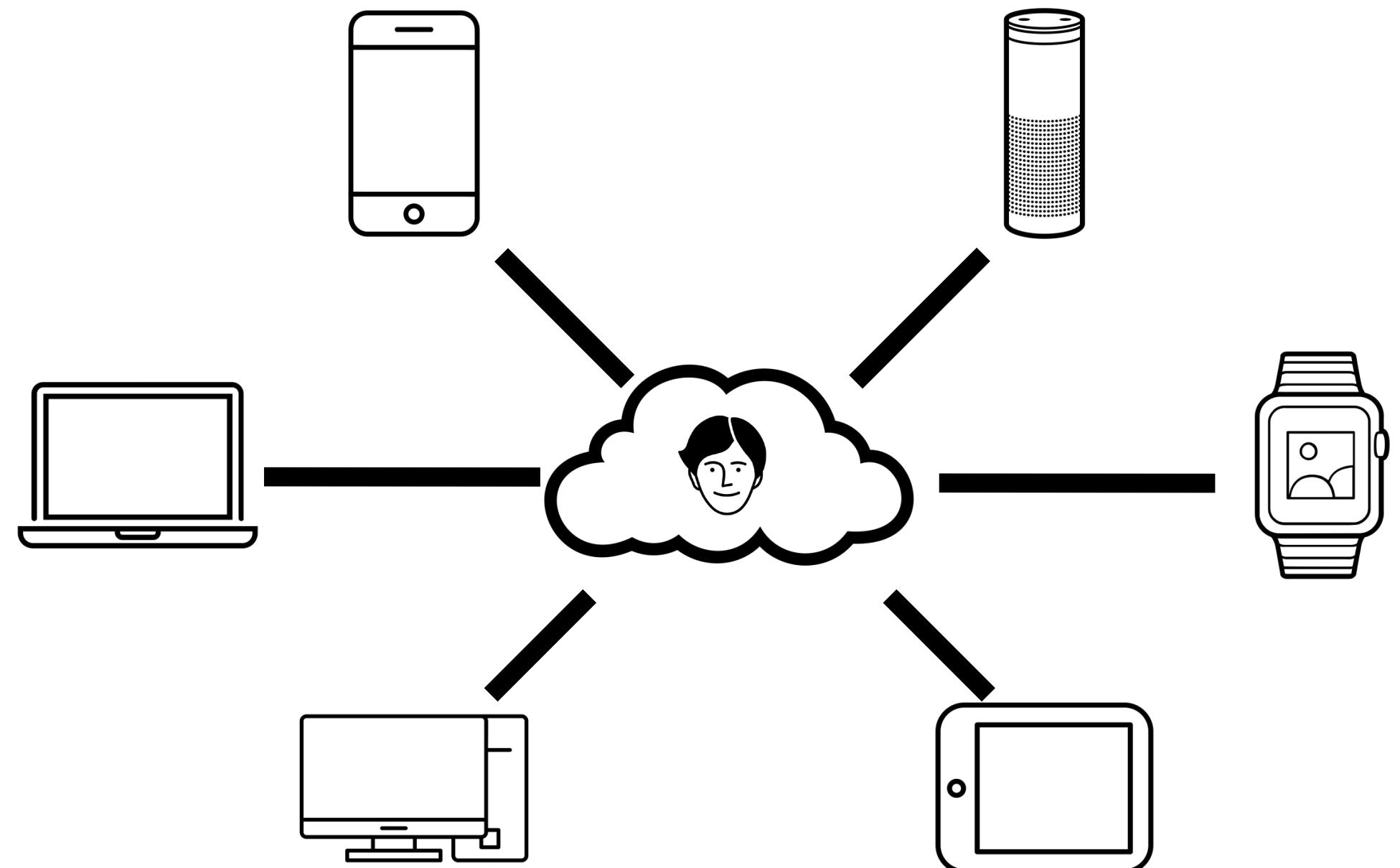
Why are web tools now the standard for interface development?

One to many, synced over the cloud



One to many, synced over the cloud

- Use HTTP requests to send data to the cloud and receive data from it
 - JavaScript provided early tools to do this
- Render that data with HTML
- Style it with CSS

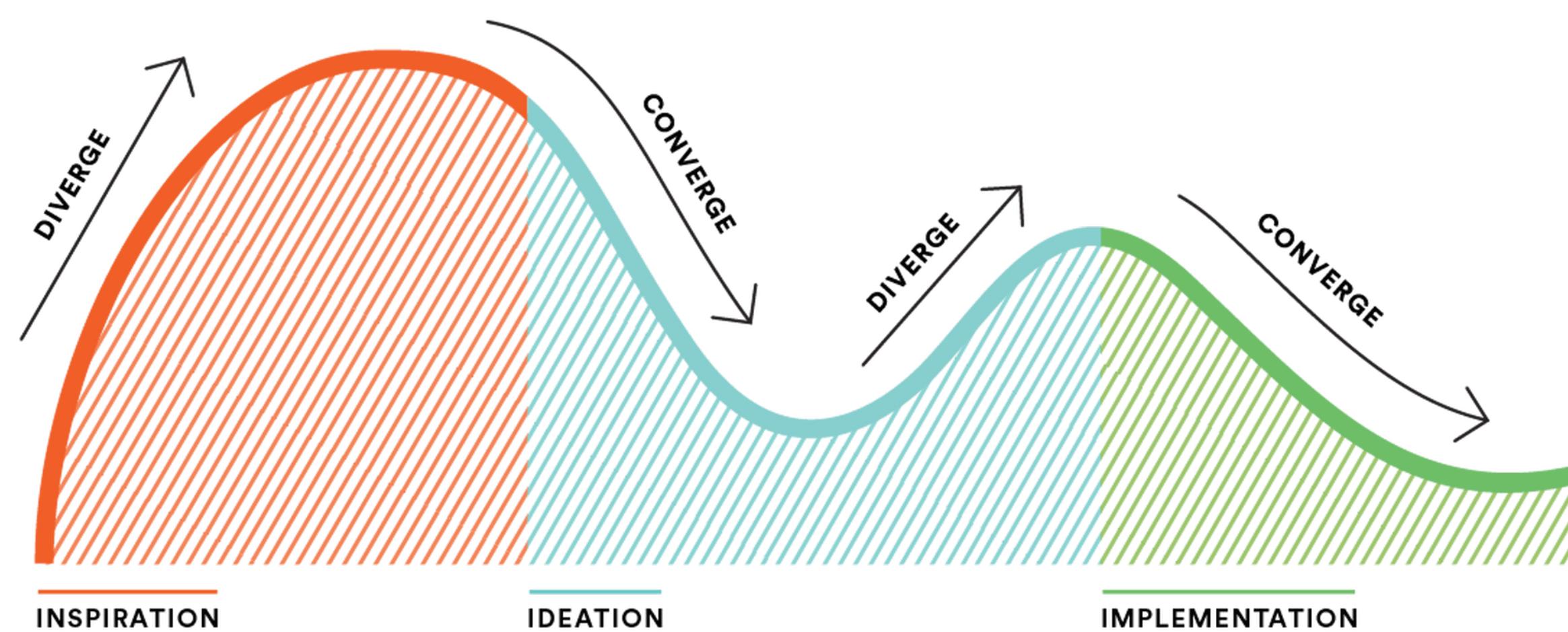


Ubiquitous computing is, in large part, why
web tools are the current standard
for interface development

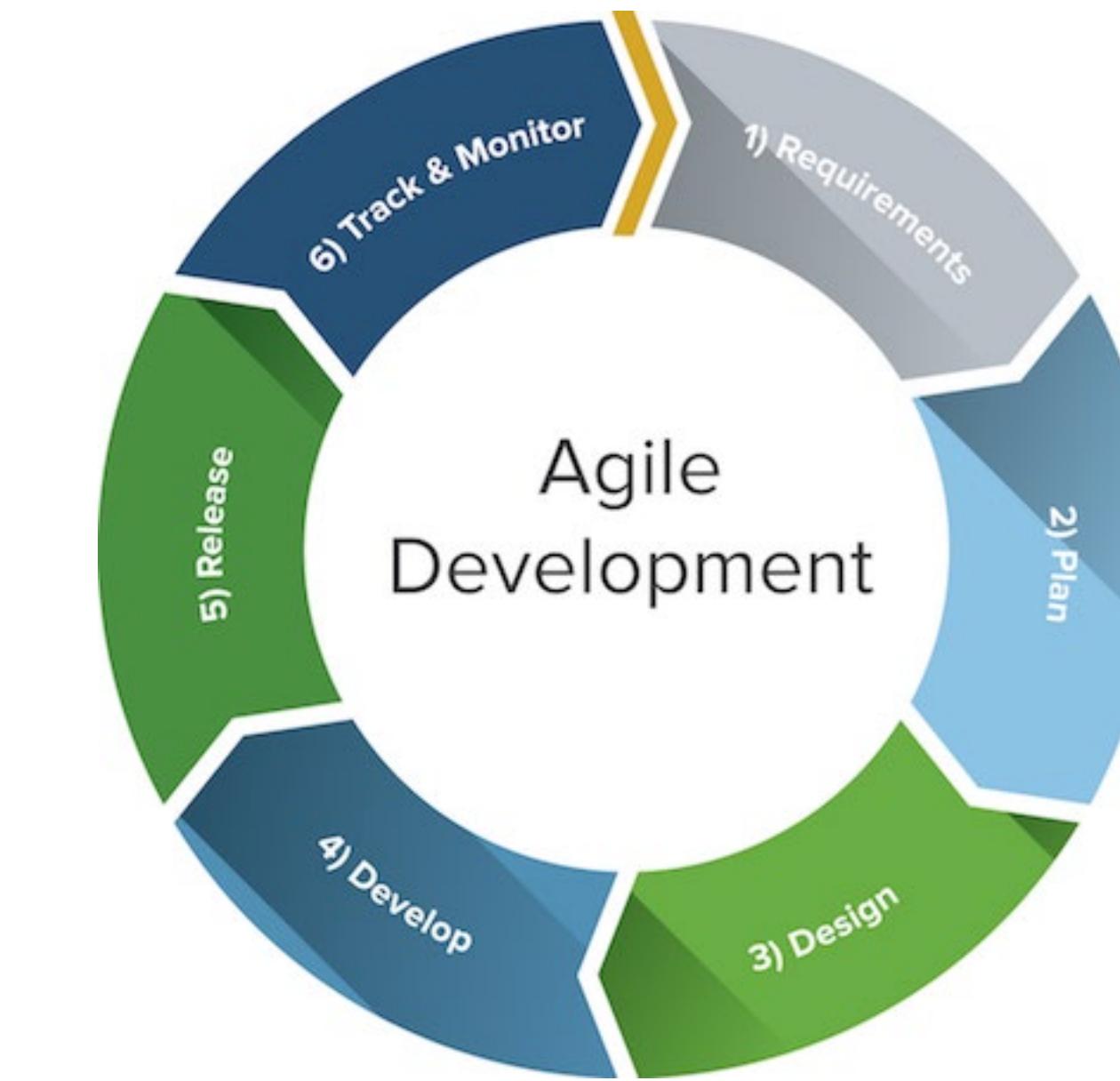
Web tools as the standard

- Nearly every platform needs to communicate with a cloud system
- Most need a web browser so people can access sites
- Shared programming language and development environment enables efficient work
- Developers can write once, deploy to many platforms
 - Hopefully customize style and functionality to the device
- Other reasons?

Product design process

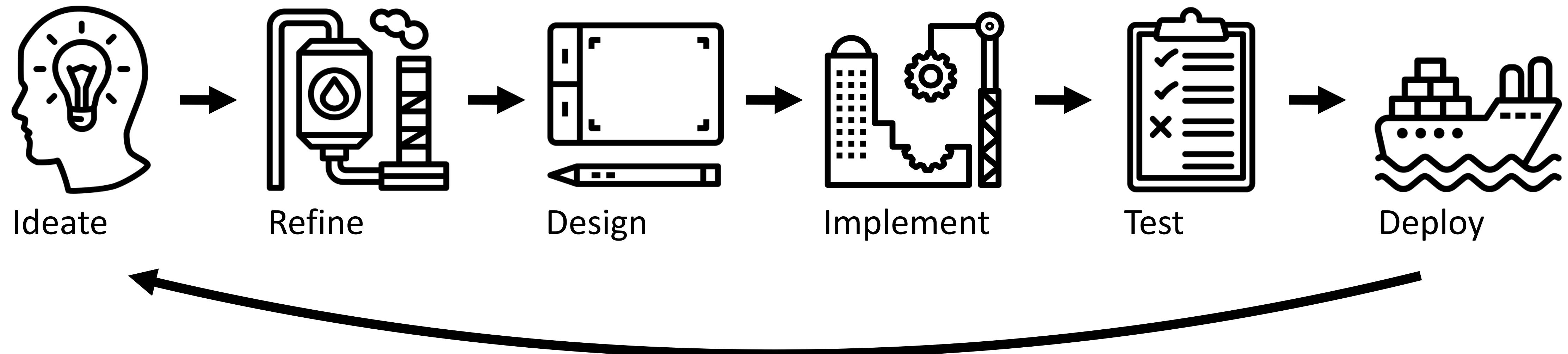


Human-Centered Design, IDEO



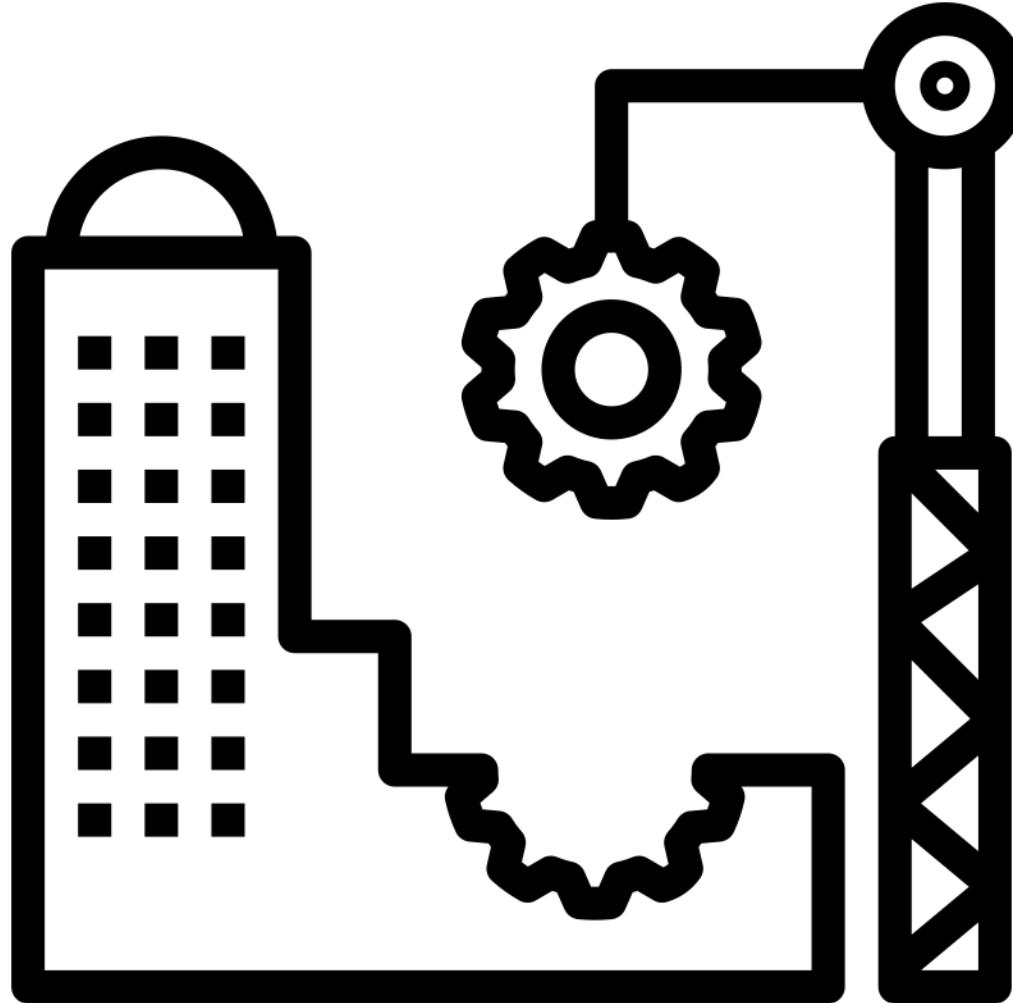
Agile Development, Agile Manifesto

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 is interface implementation today?

Often **HTML**, **CSS**, and **JavaScript**



ANGULARJS
by Google



BACKBONE.JS

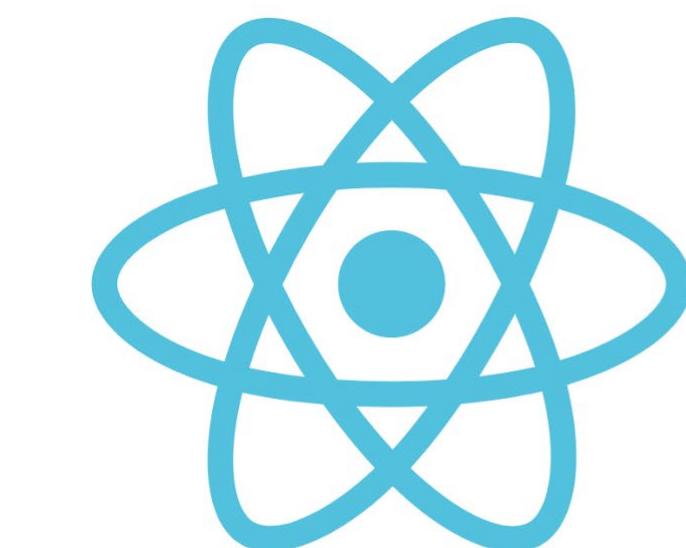
METEOR



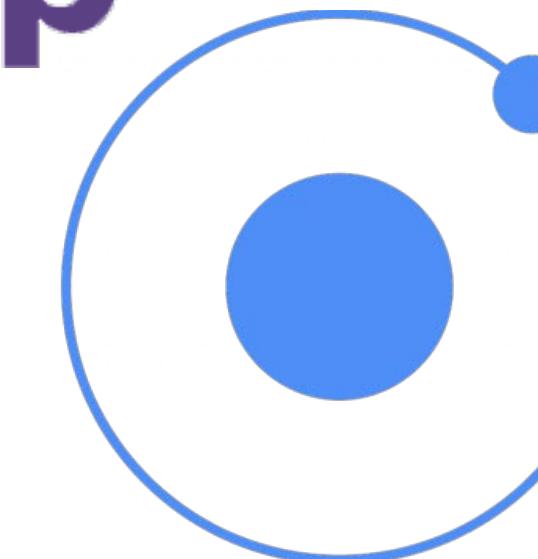
Bootstrap



jQuery



React JS



ionic

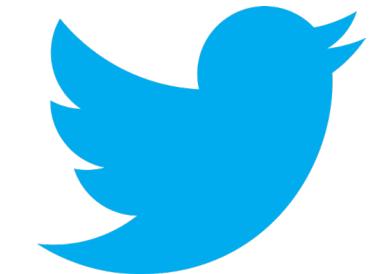
ember

There are lot of languages
and development frameworks.

Why do most people use web tools?

Assignments

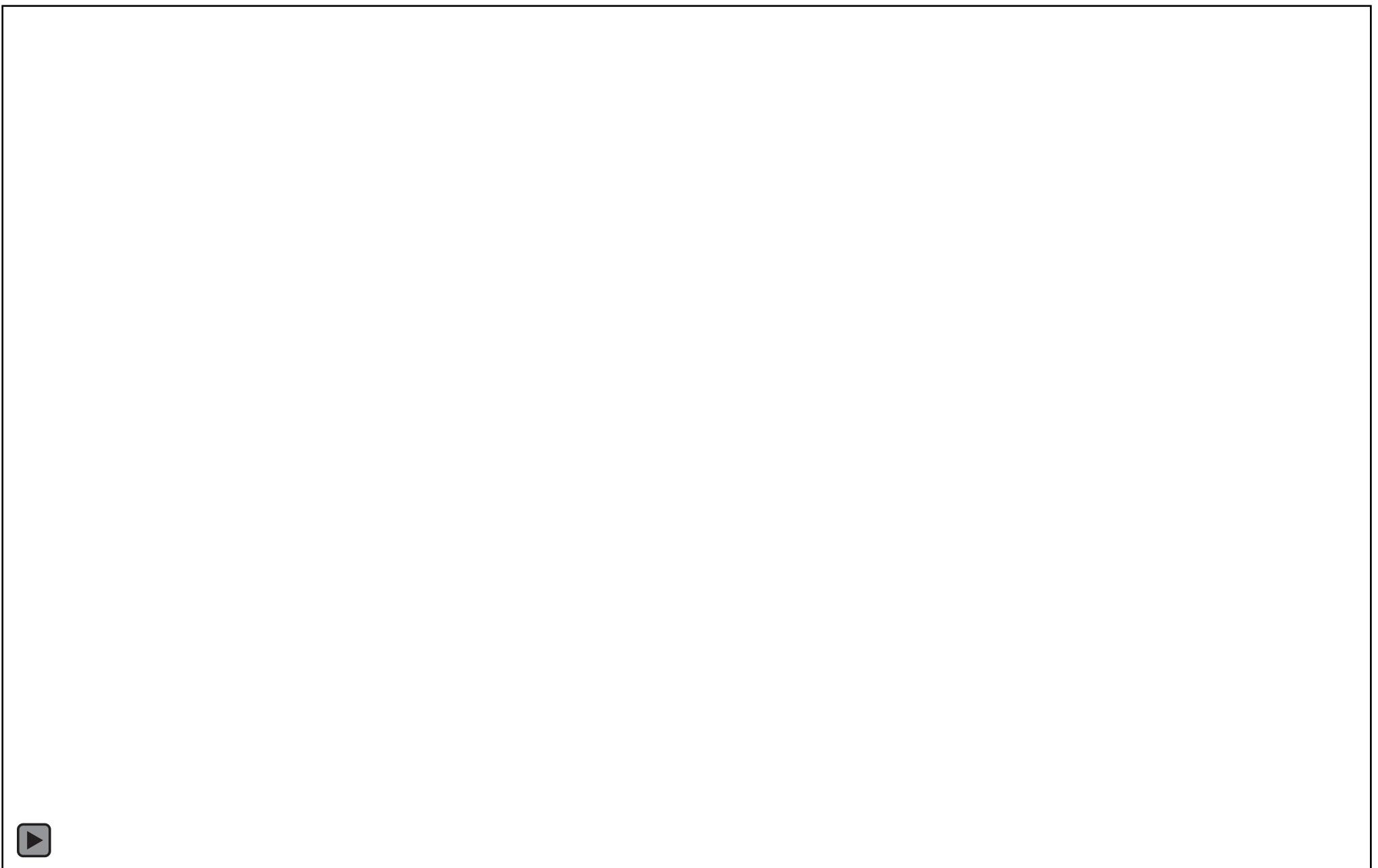
- A1: Static web with HTML and CSS
- A2: Programming on the web
- A3: Web frameworks
- A4: Mobile development
- Final Project



A2

Runkeeper Tweet Report in JavaScript and TypeScript

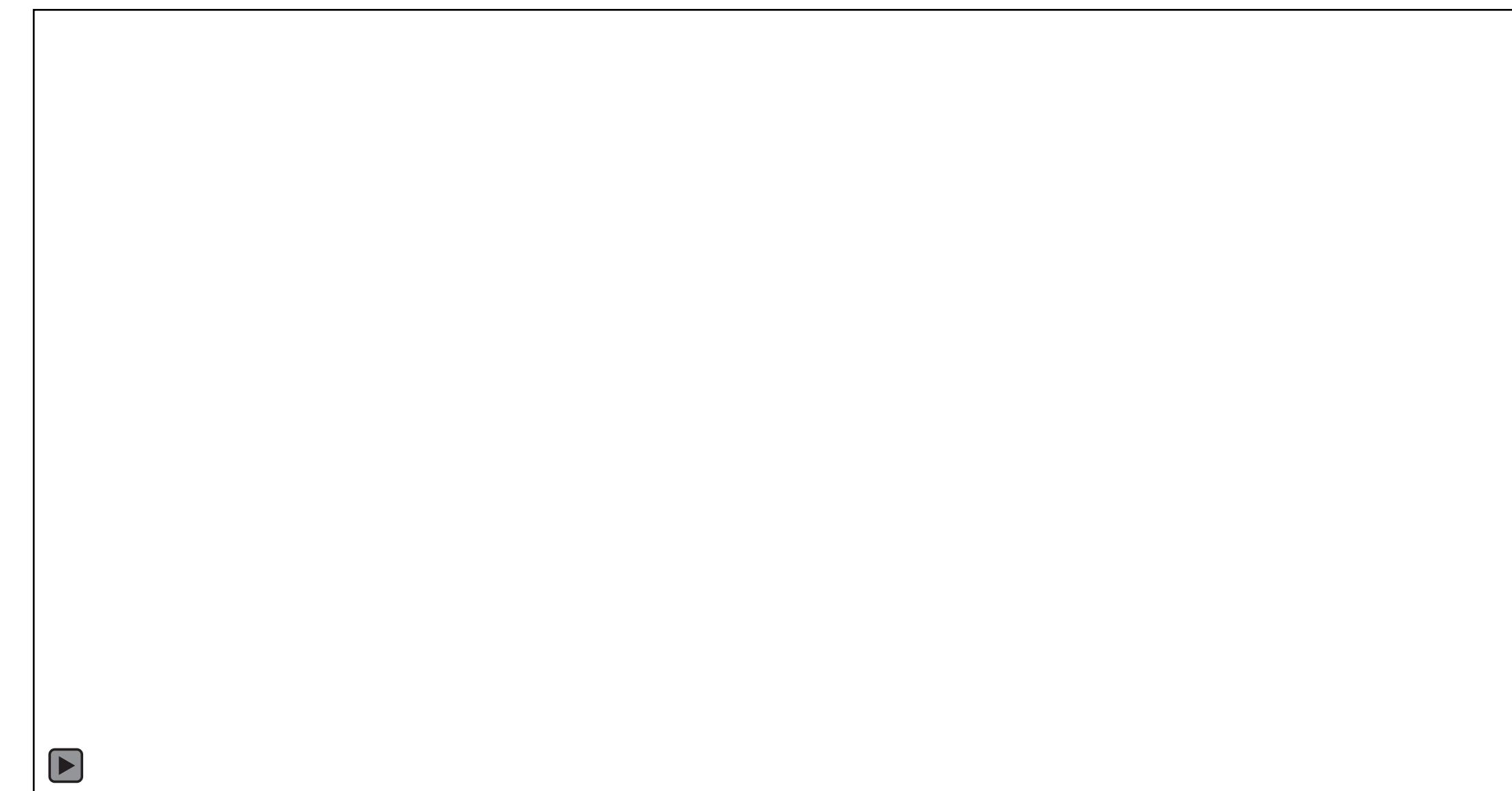
- Learning goal: become comfortable with JavaScript, a widely-used development language on the web
- Will learn to use JavaScript libraries for visualization and interaction



A3

Spotify Browser in Angular

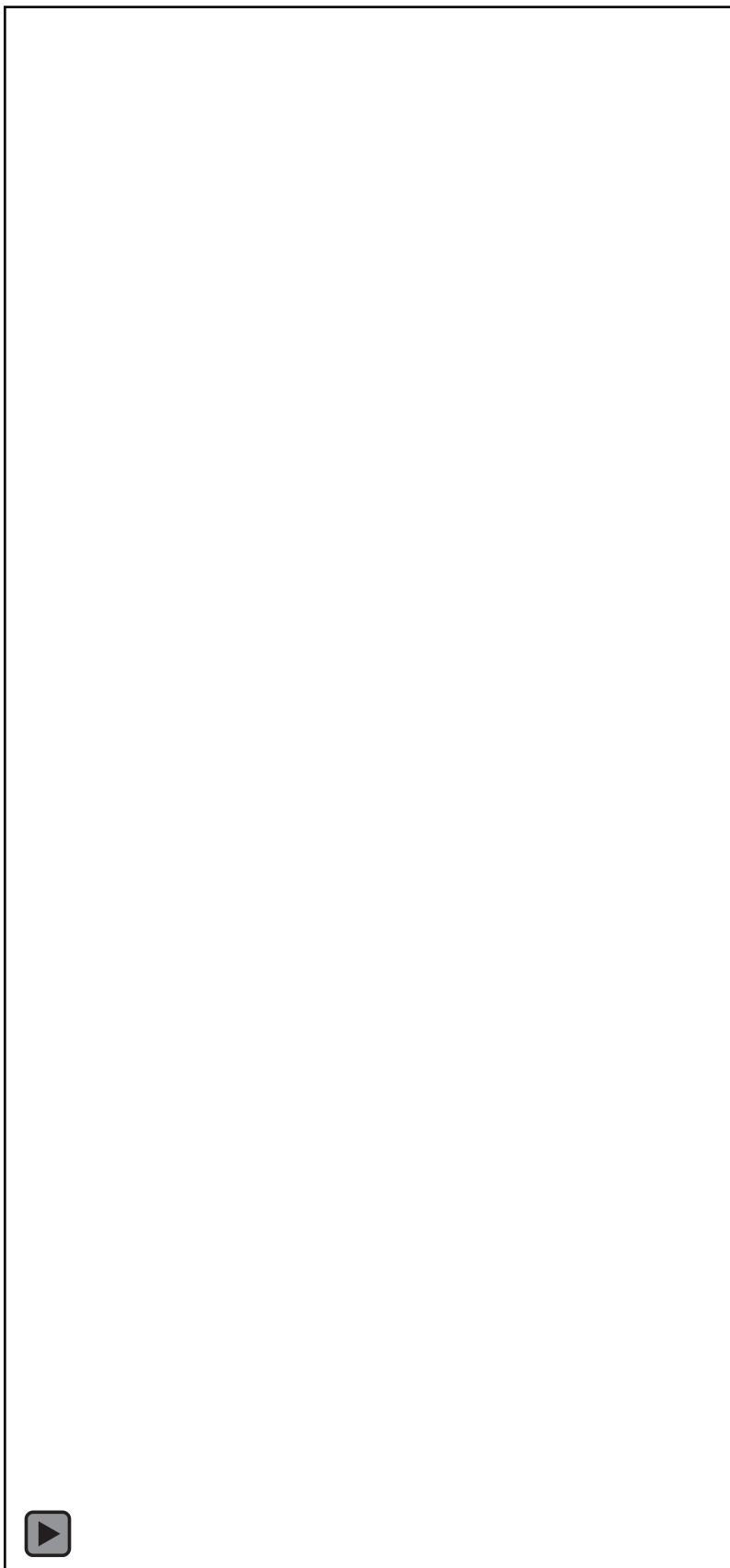
- Learning goal: develop skills in web frameworks which separate interface from data and interaction (Model-View-Controller)
- Will make an interactive browser of Spotify's library
- Optional partner



A4

Sleep Tracker Mobile App

- Learning goal: learn to leverage UI components in a mobile framework and align with principles of good mobile design
- Will implement an app to log daily sleep
- Optional partner



A5

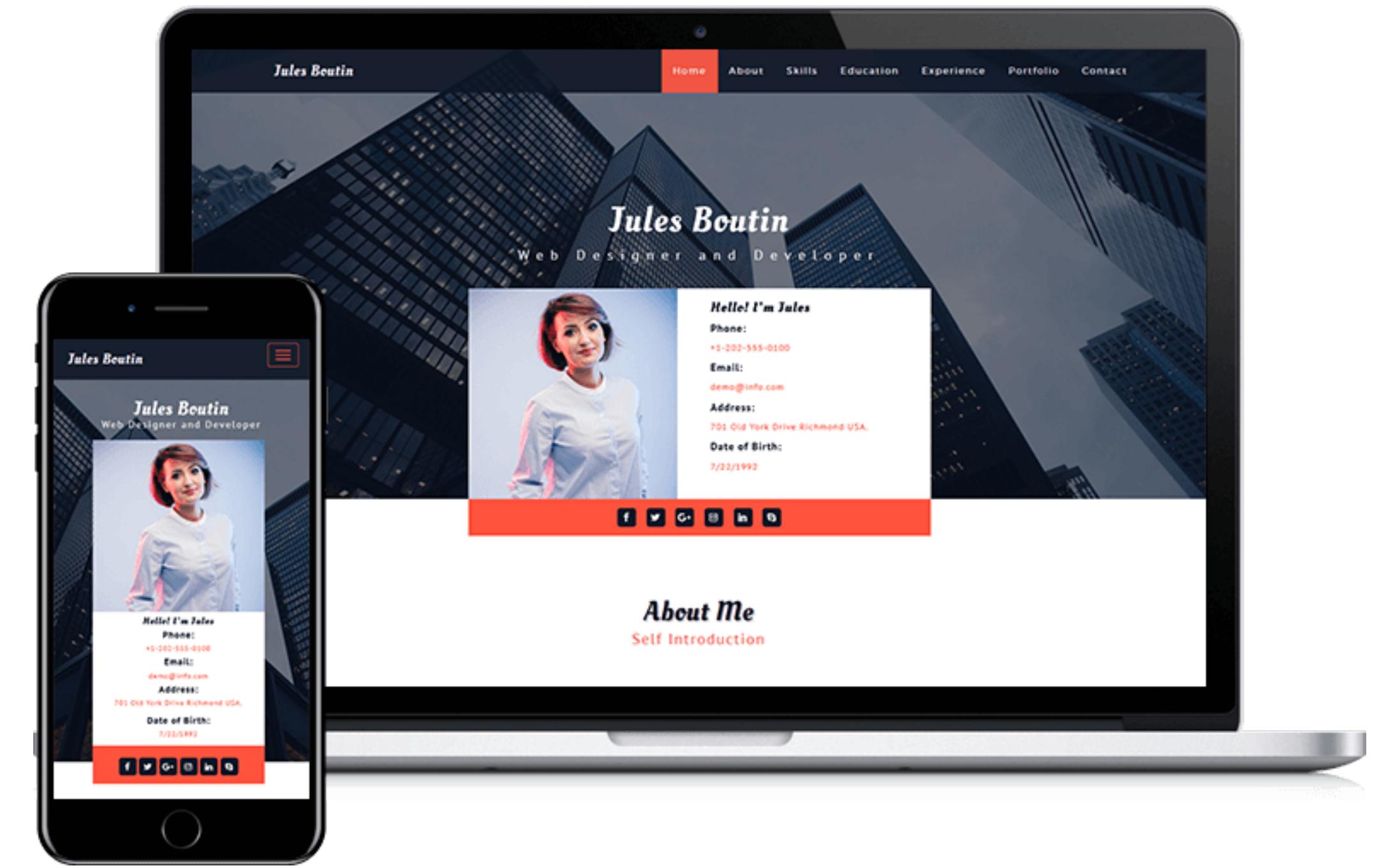
Final Project

- Learning goal: Apply principles of user interface design to build an alternative mode of interaction
- Implement with a web, mobile, or wearable framework of your choice
- Optional partner

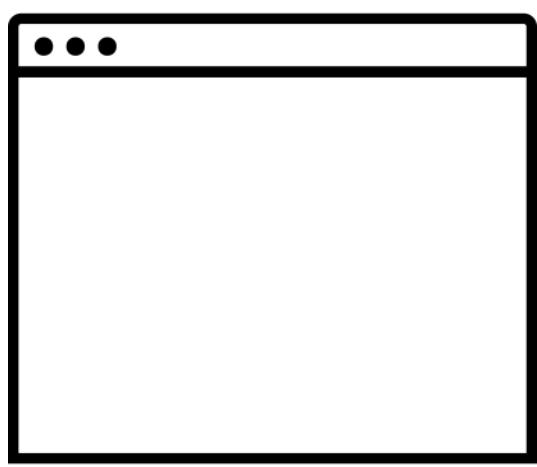
A1

Responsive Website in HTML and CSS

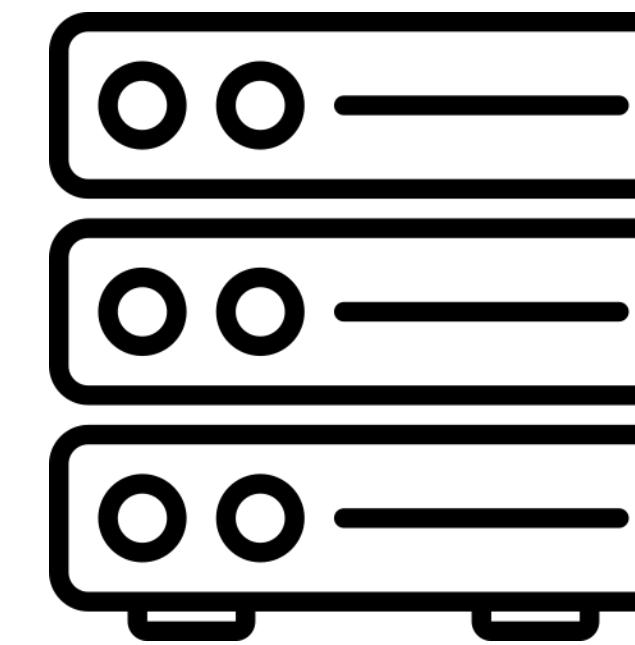
- Learning goal: develop familiarity with HTML and CSS, which form the foundation of all web design
- Apply *responsive* design, or adapt to screen size and orientation
- Let's dive in a bit more...
 - Overview
 - Classroom and github
 - IDE



Client-side web development

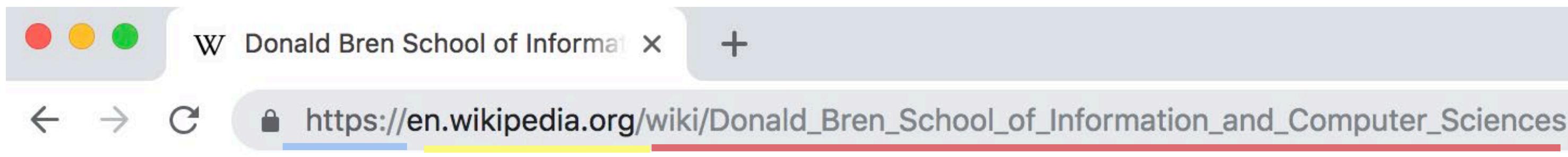


Your browser



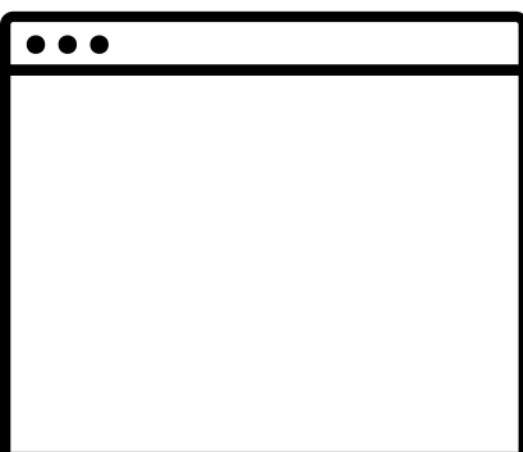
Web server

Using the internet

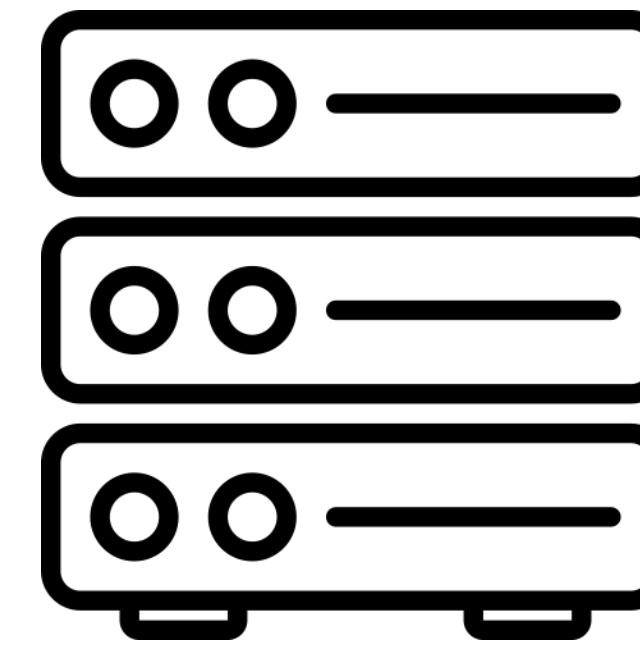
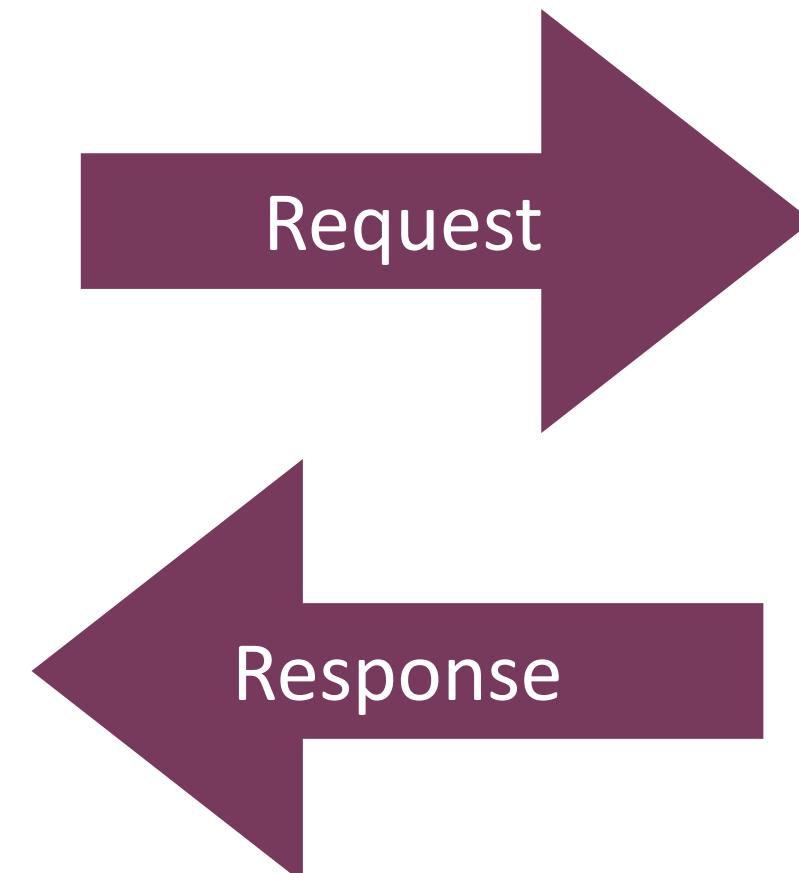


Protocol Host Resource
(how to handle info) (who has info) (what info you want)

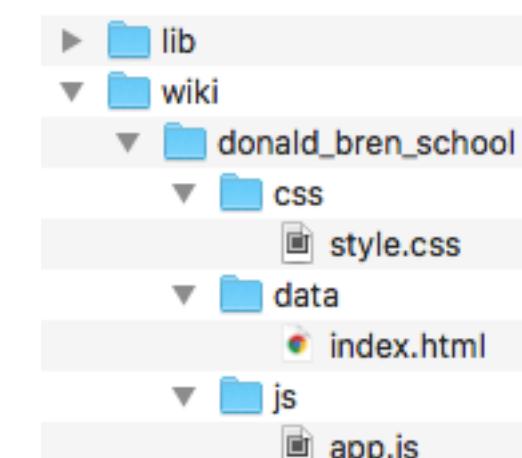
“Hey Wikipedia, I’d like
to see the page for the
school of ICS!”

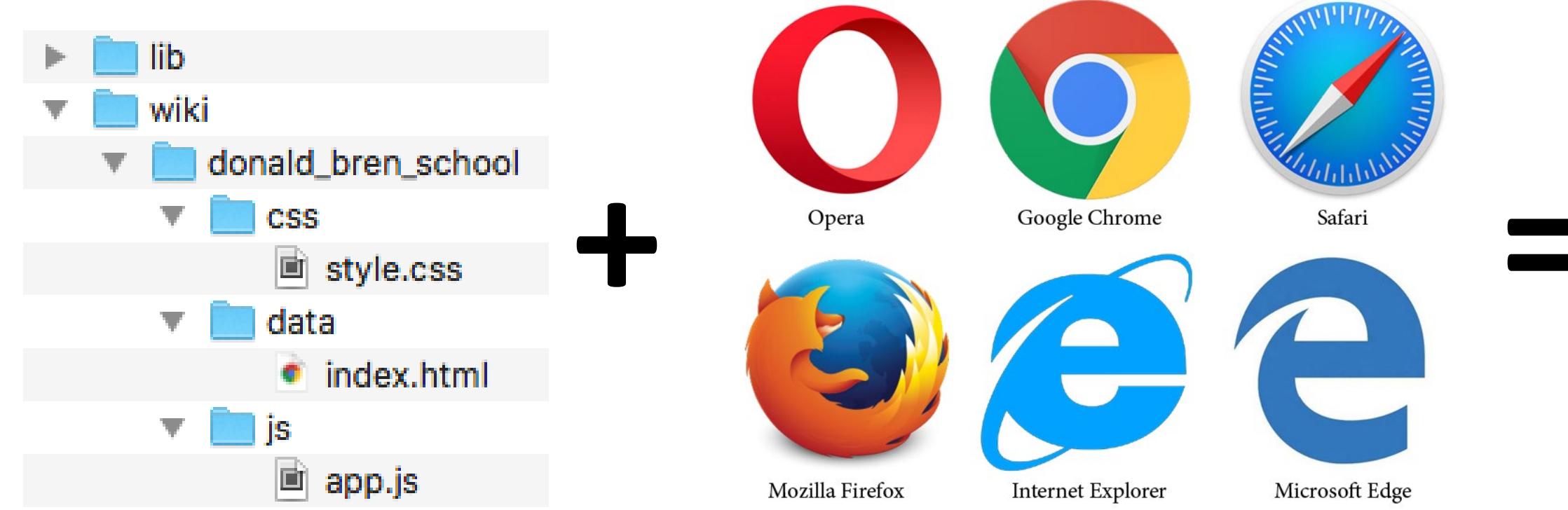


Your browser



Web server





The screenshot shows a Wikipedia article page for the **Donald Bren School of Information and Computer Sciences**. The page is from the English Wikipedia. The main content area includes a red warning banner about multiple issues and a note about potential conflicts of interest. The sidebar on the left contains links to the school's main page, contents, featured content, current events, random article, donate, and store. The right sidebar includes coordinates and a photo of the school building.

Donald Bren School of Information and Computer Sciences

From Wikipedia, the free encyclopedia

Coordinates: 33.6432°N 117.842°W

This article has multiple issues. Please help improve it or discuss these issues on the talk page. (Learn how and when to remove these template messages)

- This article contains content that is written like an advertisement. (April 2016)
- This article may rely excessively on sources too closely associated with the subject, potentially preventing the article from being verifiable and neutral. (January 2015)

The Donald Bren School of Information and Computer Sciences, also known colloquially as UCI's School of ICS or simply the Bren School, is an academic unit of University of California, Irvine (UCI), and the only dedicated school of computer science in the University of California system. Consisting of nearly three thousand students, faculty, and staff,^[2] the school maintains three buildings in the South-East artery of UCI's undergraduate campus, and maintains student body and research affiliations throughout UCI.^{[3][4]}

The school of ICS consists of three departments: Computer Science, Informatics, and Statistics. The combined groupings focus the school around the fields of computing and processing of information. The departments confer eight undergraduate, eleven masters, and seven doctoral degrees in total, with some degree programs cooperating with affiliated schools.^[5]

Donald Bren Hall, one of the buildings on the campus of the Bren School^[1]

Fundamentally, the web is
designed to send files around

So what does a file on the web look like?

What if we wanted to specify
how the content is rendered?

HTML (HyperText Markup Language)

- Adds meaning to text
- Links documents to one another
 - Vanneaver Bush, hypertext vision



Tags

`<div>` ← Open/start tag

Content goes here. ← Content

`</div>` ← Close/end tag

Whitespace and tag case are ignored

Some common tags

<h1>Heading level 1**</h1>**

<h2>Heading level 2**</h2>**

...

<p>A paragraph**</p>**

<!--A comment**-->**

**** An image

**** An unordered list (bullets)

**** A list item

<table> A data table

**** Important content (**bolded**)

**** Emphasized content (*italicized*)

<div> A division (section) of content

Tags

- There are hundreds of tags!
- You may not use them all, but it's good to explore them
- Search on Google or W3C to understand each tag's purpose
- <https://www.w3schools.com/tags/>



HTML 5 NEW TAG	
TAG NOT SUPPORTED IN HTML 5	
<!---->	Define a comment
<!DOCTYPE>	Defines the document type
<a>	Defines a hyperlink href, hreflang, media, ping, rel, target, type
<abbr>	Defines an abbreviation
<acronym>	Used to define an embedded acronym
<address>	Defines an address element
<applet>	Used to define an embedded applet
<area>	Defines an area inside an image map alt, coords, href, hreflang, media, ping, rel, shape, target, type
<article>	Defines an article cite, pubdate
<aside>	Defines content aside from the page content
<audio>	Defines sound content autobuffer, autoplay, controls, src
	Defines bold text
<base>	Defines a base URL for all the links in a page href, target
<basefont>	Used to define a default font-color, font-size, or font-family for all the document
<bdo>	Defines the direction of text display dir
<big>	Used to make text bigger
<blockquote>	Defines a long quotation cite
<body>	Defines the body element
 	Inserts a single line break
<button>	Defines a push button autofocus, disabled, form, formaction, formenctype, formmethod, formnovalidate, formtarget, name, type, value
<canvas>	Defines graphics height, width
<caption>	Defines a table caption
<center>	Used to center align text and content
<cite>	Defines a citation
<code>	Defines computer code text autobuffer, autoplay, controls, src
<col>	Defines attributes for table columns
<colgroup>	Defines groups of table columns span
<command>	Defines a command button checked, disabled, icon, label, radiogroup, type
<datalist>	Defines a dropdown list
<dd>	Defines a definition description
	Defines deleted text cite, datetime
<details>	Defines details of an element open
<dialog>	Defines a dialog (conversation)
<dfn>	Defines a definition term
<dir>	Used to define a directory list
<div>	Defines a section in a document
<dl>	Defines a definition list
<dt>	Defines a definition term
	Defines emphasized text
<embed>	Defines external interactive content or plugin height, src, type, width
<fieldset>	Defines a fieldset disabled, form, name
<figure>	Defines a group of media content, and their caption
	Used to define font face, font size, and font color of text
<footer>	Defines a footer for a section or page
<form>	Defines a form accept-charset, action, autocomplete, enctype, method, name, novalidate, target
<frame>	Used to define one particular window (frame) within a frameset
<frameset>	Used to define a frameset, which organized multiple windows (frames)
<h1> to <h6>	Defines header 1 to header 6
<head>	Defines information about the document
<header>	Defines a header for a section or page
<hgroup>	Defines information about a section in a document
<hr>	Defines a horizontal rule
<html>	Defines an html document manifest, xhtml
<i>	Defines italic text
<iframe>	Defines an inline sub window height, name, sandbox, seamless, src, width
	Defines an image alt, src, height, ismap, usemap, width
<input>	Defines an input field accept, alt, autocomplete, autofocus, checked, disabled, form, formaction, formenctype, formmethod, formnovalidate, formtarget, height, list, max, maxlength, min, multiple, name, pattern, placeholder, readonly, required, size, src, step, type, value, width
<ins>	Defines inserted text cite, datetime
<keygen>	Defines a generated key in a form autofocus, challenge, disabled, form, keytype, name
<kbd>	Defines keyboard text
<label>	Defines an inline sub window for, form
<legend>	Defines a title in a fieldset
	Defines a list item value
<link>	Defines a resource reference href, hreflang, media, rel, sizes, type
<map>	Defines an image map name
<mark>	Defines marked text
<menu>	Defines a menu list label, type
<meta>	Defines meta information charset, content, http-equiv, name
<meter>	Defines measurement within a predefined range high, low, max, min, optimum, value
<nav>	Defines navigation links
<noframes>	Used to display text for browsers that do not handle frames
<noscript>	Defines a noscript section
<object>	Defines an embedded object data, form, height, name, type, usemap, width
	Defines an ordered list reversed, start
<optgroup>	Defines an option group label, disabled
<option>	Defines an option in a drop-down list disabled, label, selected, value
<output>	Defines some types of output for, form, name
<p>	Defines a paragraph
<param>	Defines a parameter for an object name, value
<pre>	Defines preformatted text
<progress>	Defines progress of a task of any kind max, value
<q>	Defines a short quotation cite
<rp>	Used in ruby annotations to define what to show browsers that do not support the ruby element
<rt>	Defines explanation to ruby annotations
<ruby>	Defines ruby annotations
<s>, <strike>	Used to define strikethrough text

HTML5 TAG CHEAT SHEET
Created by WebsiteSetup.org

Today's goals

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

- Describe how society got to today's ubiquitous computing
- Hypothesize why web technology has become the de-facto tool for interface development
- Describe upcoming course tasks
- Describe the fundamentals of web communication