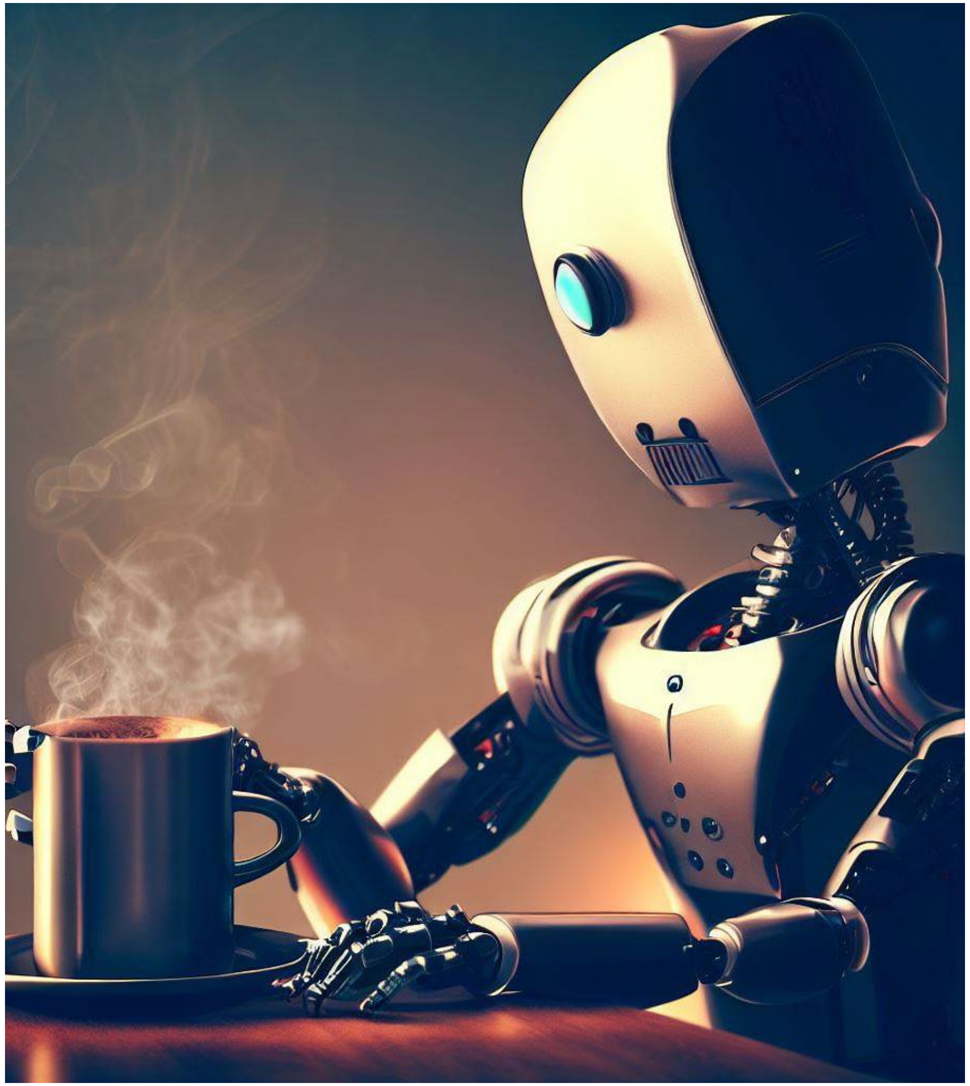


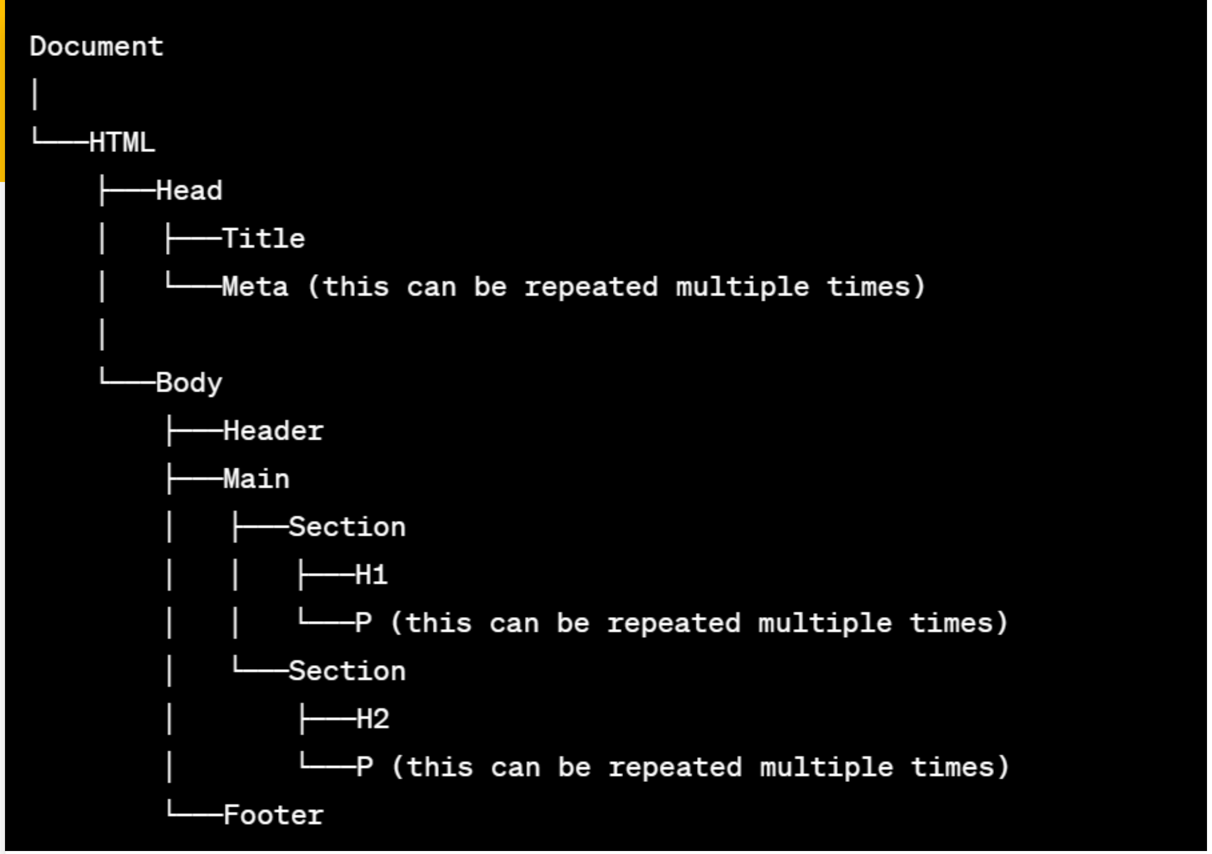
CTD Intro Week 13

The DOM API

with Javascript review

Javascript

- Javascript is not java!
- Invented in 1995 at Netscape
    - Called javascript because java was new, popular and exciting
        - But it is unrelated to java
- Standardized as ECMAScript (ECMA-262) in 1997
    - European Computer Manufacturers Association (ECMA)
- Important revisions
    - ES5 (2009)
        - Var for non-global scope, function scope only
    - ES6 (2015)
        - Lexical (block) scope with let and const
        - class, module
        - Anonymous function shorthand, arrow notation (a, b) => { }
- Most popular computer language
- Lots of built-in capabilities
- Rich set of packages available
- Highly optimized, good performance
- In all browsers
- Node.js for servers and command line apps (Google javascript engine)



```
Document
|
└──HTML
    ├──Head
    |   ├──Title
    |   └──Meta (this can be repeated multiple times)
    |
    └──Body
        ├──Header
        ├──Main
        |   ├──Section
        |   |   ├──H1
        |   |   └──P (this can be repeated multiple times)
        |   └──Section
        |       ├──H2
        |       └──P (this can be repeated multiple times)
        └──Footer
```

This is a different kind of DOM

Document Object Model (DOM)

- Javascript sees an HTML document as an object
  - Tree structure
- The root of the DOM tree is called ‘document’
  - It’s possible to navigate through the tree, but..
  - Typically, elements are located using methods which search the DOM
    - document.getElementById("myId")
    - document.getElementsByClassName("myClass")
    - document.getElementsByTagName("myTag")
    - document.querySelector(".myClass"); // first match
    - document.querySelectorAll(".myClass"); // all matches

Methods in this lesson

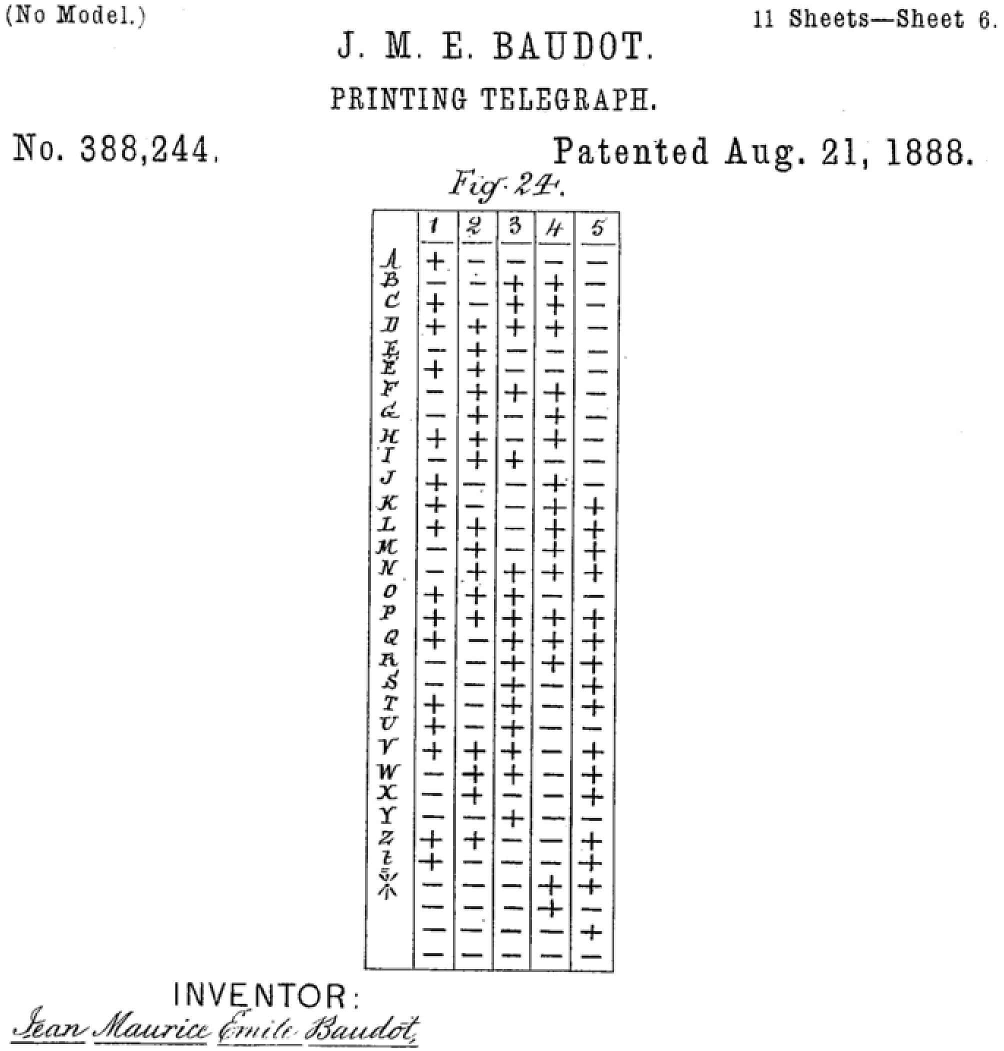
- The Date() object
  - Let date = new Date()
  - getFullYear method
- Element methods and attributes
  - innerHTML – the HTML inside a nested structure
  - appendChild() – add a new child element
  - createElement() – create a new element
- Queries (repeat)
    - document.getElementById("myId")
    - document.getElementsByClassName("myClass")
    - document.getElementsByTagName("myTag")
    - document.querySelector(".myClass"); // first match
    - document.querySelectorAll(".myClass"); // all matches

More javascript facts

- First class functions
  - Functions can be assigned to variable (not true in every language!)
    - myObject.func returns the function
    - myObject.func() calls the function
- Very permissive
  - Doesn’t, by default report errors on many things which are probably wrong
  - Automatic conversions between types
  - Doesn’t check type or number of function arguments
    - Fills in with undefined values if necessary
  - Typescript was invented to fix this
- Convenient object model
  - Any mix of indexed arrays […] and associative arrays {…}
    - Mixed datatypes
  - So simple and useful, it became a data exchange standard
    - JavaScript Object Notation (JSON)

Unicode

- Standard encoding for text (and other things)
- Old standards were 8 or fewer bits
    - Baudot – 5 bits, for teletypes, from 1870
    - ASCII – American Standard Code for Information Interchange (7 bits with parity)
    - EBCDIC (IBM) – Extended Binary Coded Decimal Interchange Code
- Family of coding standards which can be mixed
    - e.g. UTF8, UTF16, UTF32
    - 149186 characters
    - 161 script types
    - Even emojis!
- Inserting by code:
    - Named characters, e.g. &copy
    - Html hex code: &#x00A9
    - Javascript: '\\u{00A9}
- One of many references:
    - [Unicode/List of useful symbols - Wikibooks, open books for an open world]()



(No Model.)

11 Sheets—Sheet 6.

J. M. E. BAUDOT.

PRINTING TELEGRAPH.

No. 388,244.

Patented Aug. 21, 1888.

Fig. 24.

	1	2	3	4	5
A	+	−	−	−	−
B	−	−	+	+	−
C	+	−	+	+	−
D	+	+	+	+	−
E	−	+	−	−	−
É	+	+	−	−	−
F	−	+	+	+	−
G	−	+	−	+	−
H	+	+	−	+	−
I	−	+	+	−	−
J	+	−	−	+	−
K	+	−	−	+	+
L	+	+	−	+	+
M	−	+	−	+	+
N	−	+	+	+	+
O	+	+	+	−	−
P	+	+	+	+	+
Q	+	−	+	+	+
R	−	−	+	+	+
S	−	−	+	−	+
T	+	−	+	−	+
U	+	−	+	−	−
V	+	+	+	−	+
W	−	+	+	−	+
X	−	+	−	−	+
Y	−	−	+	−	−
Z	+	+	−	−	+
t	+	−	−	−	+
*	−	−	−	+	+
	−	−	−	+	−
	−	−	−	−	+
	−	−	−	−	−

INVENTOR:
Jean Maurice Émile Baudot,

Questions?

Demo