cssinjs

A brownbag Q&A at

MX®

by Seth House

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A (little) history

Glamor vs <insert lib here>

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- Discussed multiple times in the last few years.

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  - Increase technical debt across MX.

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- Payload size could be improved.
- Styles bleed "downward" (namespacing is an imperfect encapsulation).

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My guess: since we've dropped IE11 support our next pivot will be "the platform".
CSS variables for Kyper tokens, Shadow DOM for encapsulation.

cssinjs

https://github.com/mxenabled/cssinjs/

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Thank you!

- Kyper Team.

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- David Alger.

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- Kyper Team.
- Jared Gerlach.
- David Alger.
- Peter, Maddie, Sam, & several others.

Caveat: order-dependent styles

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```
// Doesn't work:
css({
  borderTop: '1px solid',
  borderColor: 'blue',
})

// Works (but still not a good idea):
css({
  borderRight: '1px solid',
  borderColor: 'blue',
})
```

Why?

Interlude:

Data Structures

Data structures

(a,b)-tree, 2-3 heap, 2-3 tree, 2-3-4 tree, AA tree, AF-heap, AList, AVL tree, Abstract syntax tree, Adaptive k-d tree, Adjacency list, Adjacency matrix, Alternating decision tree, And-inverter graph, And-or tree, Array, Array list, Association list, Associative array, B sharp tree, B*-tree, B+ tree, B-heap, B-tree, BK-tree, BSP tree, Beap, Bin, Binary decision diagram, Binary heap, Binary search tree, Binary tree, Binomial heap, Bit array, Bit field, Bitboard, Bitmap, Bloom filter, Bounding interval hierarchy, Bounding volume hierarchy, Brodal queue, Bx-tree, C tree, Cartesian tree, Circular buffer, Collection, Compressed suffix array, Conc-tree list, Container, Control table, Count-min sketch, Cover tree, Ctrie, D-ary heap, Dancing tree, Decision tree, Difference list, Directed acyclic graph, Directed acyclic word graph, Directed graph, Disjoint-set, Disjoint-set data structure (Union-find data structure), Distributed hash table, Dope vector, Double hashing, Double-ended priority queue, Double-ended queue, Doubly connected edge list also known as half-edge, Doubly linked list, Dynamic array, Dynamic perfect hash table, Enfilade, Expectiminimax tree, Exponential tree, Expression tree, FM-index, Fenwick tree, Fibonacci heap, Finger tree, Free list, Fusion tree, Gap buffer, Generalised suffix tree, Graph, Graph-structured stack, Hash array mapped trie, Hash list, Hash table, Hash tree, Hash trie, Hashed array tree, Heap, Hilbert R-tree, Hypergraph, Iliffe vector, Image, Implicit k-d tree, Interval tree, Judy array, K-ary tree, K-d tree, Koorde, Left-child right-sibling binary tree, Leftist heap, Leonardo heap, Lexicographic Search Tree, Lightmap, Linear octree, Link/cut tree, Linked list, List, Log-structured merge-tree, Lookup table, M-tree, Map, Matrix, Merkle tree, Metric tree, Min/max k-d tree, MinHash, Minimax tree, Multigraph, Multimap, Multiset, Octree, Order statistic tree, Pagoda, Pairing heap, Parallel array, Parse tree, Piece table, Prefix hash tree, Priority queue, Propositional directed acyclic graph, Quad-edge, Quadtree, Queap, Queue, Quotient filter, R* tree, R+ tree, R-tree, R* tree, R+ tree, Radix tree, Randomized binary search tree, Range tree, Rapidly exploring random tree, Record, Red-black tree, Relaxed k-d tree, Retrieval Data Structure, Rolling hash, Rope, Rose tree, Routing table, SPQR-tree, Scapegoat tree, Scene graph, Segment tree, Self-balancing binary search tree, Self-balancing tree, Self-organizing list, Set, Skew heap, Skip list, Soft heap, Sorted array, Spaghetti stack, Sparse matrix, Splay tree, Stack, Suffix array, Suffix tree, Symbol table, T-tree, Tagged union, Tango tree, Ternary heap, Ternary tree, Threaded binary tree, Top tree, Treap, Tree, Trie, Tuple, UB-tree, Union, Unrolled linked list, VList, VP-tree, Van Emde Boas tree, Variable-length array, WAVL tree, Weak heap, Weight-balanced tree, Winged edge, X-fast trie, X-tree, XOR linked list, Xor linked list, Y-fast trie, Z-order, Zero-suppressed decision diagram, Zipper, bag, discriminated union, disjoint union, structure, variant, variant record.

Associative array

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    foo: 'Foo!',
    bar: 'Bar!',
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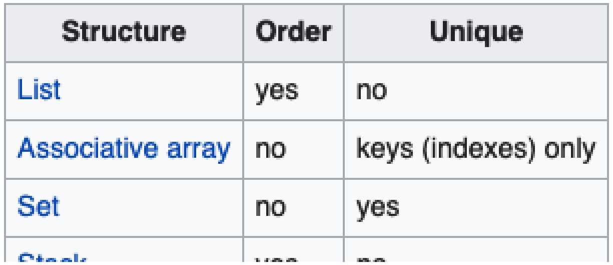

Structure	Order	Unique
List	yes	no
Associative array	no	keys (indexes) only
Set	no	yes

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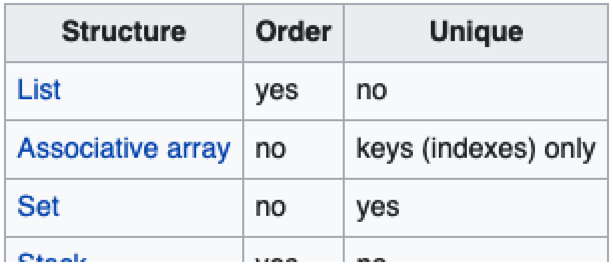

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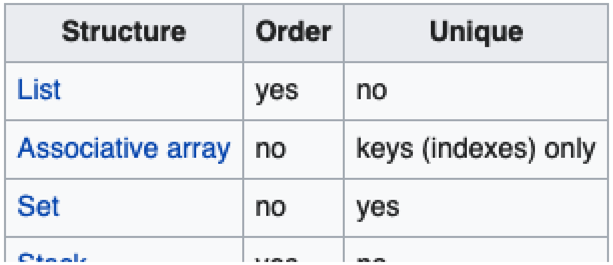

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JavaScript, Python, Ruby, C#, Java, Lua, others -- all *unordered*! *

Explore data structure characteristics

```
console.log('Generating big data structures...')
var uniqueId = () => (Math.random() + 1).toString(36).substring(2)
var BigArray = Array.from({length: 1000000}, () => uniqueId())
var BigObject = Object.fromEntries(BigArray.map((x, i) => [x, i]))
var firstItem = BigArray[0]
var lastItem = BigArray[BigArray.length - 1]
console.log('...done. Starting lookups:')

console.time('Array traversal (first)')
BigArray.find(x => x === firstItem)
console.timeEnd('Array traversal (first)')

console.time('Array traversal (last)')
BigArray.find(x => x === lastItem)
console.timeEnd('Array traversal (last)')

console.time('Object lookup (first)')
BigObject[firstItem]
console.timeEnd('Object lookup (first)')

console.time('Object lookup (last)')
BigObject[lastItem]
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Insertion-order-preserving structure

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const MyMap = new Map();
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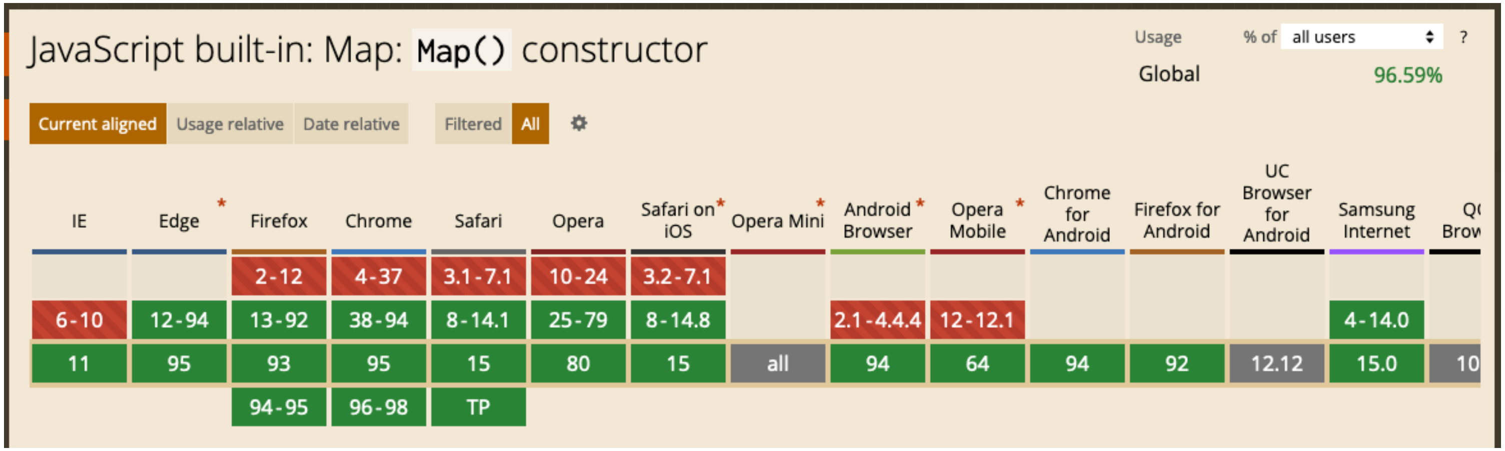

JavaScript built-in: Map: `Map()` constructor

Usage % of all users ?

Global 96.59%

Current aligned | Usage relative | Date relative | Filtered | All

IE	Edge *	Firefox	Chrome	Safari	Opera	Safari on iOS *	Opera Mini *	Android Browser *	Opera Mobile *	Chrome for Android	Firefox for Android	UC Browser for Android	Samsung Internet	Q Brow
		2-12	4-37	3.1-7.1	10-24	3.2-7.1								
6-10	12-94	13-92	38-94	8-14.1	25-79	8-14.8		2.1-4.4.4	12-12.1				4-14.0	
11	95	93	95	15	80	15	all	94	64	94	92	12.12	15.0	10
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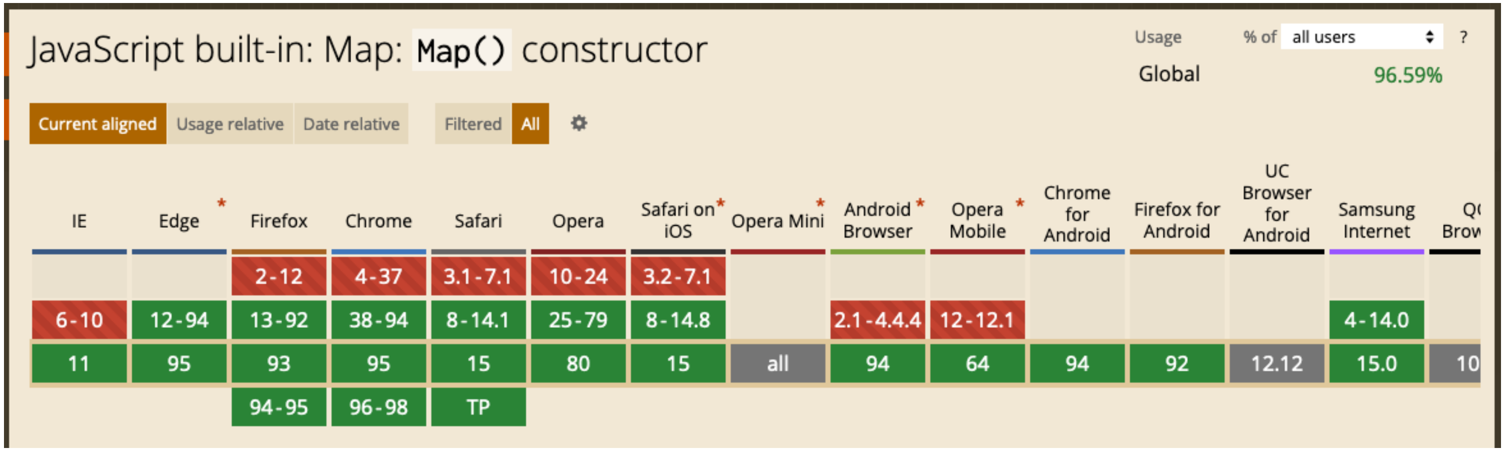

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Python, Ruby, C#, Java, Lua, and others also have separate order-preserving structures.

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- Python and Ruby have recently(!) made similar order-preserving changes to the base data structure.
- Is all this advice now antiquated?

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  (E.g. the CSS library that we are currently using, and React (as a console warning).)
- We have usable order-preserving-specific data structures.

Interlude Concluded

Caveat: order-dependent styles

```
// Bad:
css({
  borderTop: '1px solid',
  borderColor: 'blue',
})

// Good:
css({
  borderRightWidth: '1px',
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Feel free to mix-and-match longhand and shorthand CSS styles! However, beware order-dependent styles.

Aside: inline styles too

```
<div style={{
    borderTop: '1px solid',
    borderColor: 'blue',
  }}>
    Hello, world.
</div>
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```
<div style={{
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React 16.13.0+ detects potentially conflicting styles and throws a warning.