

Language Map for JavaScript

<p>Variable Declaration <i>Is this language strongly typed or dynamically typed? Provide at least three examples (with different data types or keywords) of how variables are declared in this language.</i></p>	<p>Dynamically typed. var x=1; let x=1; const x=1;</p>
<p>Data Types <i>List all of the data types (and ranges) supported by this language.</i></p>	<ul style="list-style-type: none"> - String – 16-bit unsigned - 2⁵³ - Number – double precision 64-bit binary - $\pm(2^{-1074}$ to $2^{1024})$ - BigInt - 9,007,199,254,740 - -9,007,199,254,740,991 - Boolean – true/false - Undefined – one value “undefined” – no value - Null – one value NULL - no object - Symbol - unique primitive value and may be used as the key of an Object property.
<p>Selection Structures <i>Provide examples of all selection structures supported by this language (if, if else, etc.) Don’t just list them, show code samples of how each would look in a real program.</i></p>	<p>If, if-else, switch:</p> <pre>let age = 22 if (age >= 21) { CanPurchaseAlcohol = "Yes"; }</pre> <hr/> <pre>let age = 19 if (age >= 21) { CanPurchaseAlcohol = "Yes" } else { CanPurchaseAlcohol = "No" };</pre> <hr/> <pre>switch(Schedule) { case "Monday": text = "I have morning class on Monday."; break; case "Wednesday": text = "I have work on Weds and night class. "; break; case "Friday": text = "I work get off at noon on Friday!"; break; default: text = "I work 8-5 but don't have class"; };</pre>

Repetition Structures <i>Provide examples of all repetition structures supported by this language (loops, etc.) Don't just list them, show code samples of how each would look in a real program.</i>	<p>While, for, do-loops.</p> <pre> <!DOCTYPE html> <html> <body> <h2>While Loop</h2> <p id="WhileLoop"></p> <script> let counter = ""; let i = 0; while (i < 7) { counter += "
 The count is " + i; i++; } document.getElementById("WhileLoop").innerHTML = counter; </script> </body> </html> </pre> <hr/> <pre> <!DOCTYPE html> <html> <body> <h2>JavaScript For Loop</h2> <p id="Calendar"></p> <script> const days = ["Mon", "Tues", "Weds", "Thurs", "Fri", "Sat", "Sun"]; let day = ""; for (let i = 0; i < days.length; i++) { </pre>

	<pre> day += days[i] + "
"; } document.getElementById("Calendar").innerHTML = day; </script> </body> </html> </pre> <hr/> <pre> <!DOCTYPE html> <html> <body> <h1>Do Loop</h1> <h2>Months</h2> <p id="calendar"></p> <script> let month = ""; let i = 1; do { month += i + "
"; i++; } while (i < 13); document.getElementById("calendar").innerHTML = month; </script> </body> </html> </pre>
Arrays <i>If this language supports arrays, provide at least two examples of creating an array with a primitive or String data types (e.g. float, int, String, etc.)</i>	<pre> const Days = ["Mon", "Tues", "Weds"]; var rank = [1, 2, 3]; </pre>
Data Structures <i>If this language provides a standard set of data structures, provide a list of the data structures and their Big-Oh complexity.</i>	

1. Stack
2. Queue
3. Linked List
4. Set
5. Hash Table
6. Trees
7. Graph

I'm a little confused on what is meant on a standard big o complexity of a standard structure, as I believe it depends on how the function is being implemented as to complexity of operations?

Common Data Structure Operations

Data Structure	Time Complexity								Space Complexity
	Average				Worst				Worst
	Access	Search	Insertion	Deletion	Access	Search	Insertion	Deletion	
Array	$\theta(1)$	$\theta(n)$	$\theta(n)$	$\theta(n)$	$\theta(1)$	$\theta(n)$	$\theta(n)$	$\theta(n)$	$\theta(n)$
Stack	$\theta(n)$	$\theta(n)$	$\theta(1)$	$\theta(1)$	$\theta(n)$	$\theta(n)$	$\theta(1)$	$\theta(1)$	$\theta(n)$
Queue	$\theta(n)$	$\theta(n)$	$\theta(1)$	$\theta(1)$	$\theta(n)$	$\theta(n)$	$\theta(1)$	$\theta(1)$	$\theta(n)$
Singly-Linked List	$\theta(n)$	$\theta(n)$	$\theta(1)$	$\theta(1)$	$\theta(n)$	$\theta(n)$	$\theta(1)$	$\theta(1)$	$\theta(n)$
Doubly-Linked List	$\theta(n)$	$\theta(n)$	$\theta(1)$	$\theta(1)$	$\theta(n)$	$\theta(n)$	$\theta(1)$	$\theta(1)$	$\theta(n)$
Skip List	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(n)$	$\theta(n)$	$\theta(n)$	$\theta(n)$	$\theta(n \log(n))$
Hash Table	N/A	$\theta(1)$	$\theta(1)$	$\theta(1)$	N/A	$\theta(n)$	$\theta(n)$	$\theta(n)$	$\theta(n)$
Binary Search Tree	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(n)$	$\theta(n)$	$\theta(n)$	$\theta(n)$	$\theta(n)$
Cartesian Tree	N/A	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	N/A	$\theta(n)$	$\theta(n)$	$\theta(n)$	$\theta(n)$
B-Tree	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(n)$
Red-Black Tree	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(n)$
Splay Tree	N/A	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	N/A	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(n)$
AVL Tree	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(n)$
KD Tree	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(\log(n))$	$\theta(n)$	$\theta(n)$	$\theta(n)$	$\theta(n)$	$\theta(n)$

Objects

If this language support object-orientation, provide an example of how you would write a simple object with a default constructor and then how you would instantiate it.

	<pre> <!DOCTYPE html> <html> <body> <h2>Student Desc</h2> <p id="Student"></p> <script> const person = { first_name: "Cassidy", last_name: "Jackson", age: 34 }; document.getElementById("Student").innerHTML = person.first_name + " " + person.last_name + " is " + person.age + " years old, and is a student at Bellarmine"; </script> </body> </html> </pre>
Runtime Environment <i>What runtime environment does this language compile to? For example, Java compiles to the Java Virtual Machine. Do other languages also compile to this runtime?</i>	Web browsers or Node, html and CSSS also compiles with a browser.
Libraries/Frameworks <i>What are the popular libraries or frameworks used by programmers for this language? List at least three (3) and describe what they are used for..</i>	jQuery – HTML manipulation and transversal and event handling. Angular – App development Ember – resizable web apps.
Domains <i>What industries or domains use this programming language? Provide specific examples of companies that use this language and what they use it for. E.g. Company X uses C# for its line of business applications.</i>	Humana – web app development Facebook – React Paypal – Node JS backend