# Language Map for JavaScript

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| **Variable Declaration**<br>*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.* | JavaScript is a dynamically typed language.<br>*let name;*<br>*var num;*<br>*const DONT_CHANGE;* |
| **Data Types**<br>*List all of the data types (and ranges) supported by this language.* | Number type (capable of storing floating-point numbers between $2^{-1074} - 2^{1024}$, but can only store in integers in the range $-(2^{53} - 1)$ to $2^{53} - 1$.<br><br>BigInt type (represents integers with arbitrary precision, store and operate on large integers even beyond the safe integer limit of Numbers)<br><br>String type (a set of 16-bit unsigned integer values)<br><br>Boolean type (true \|\| false)<br><br>Null type (null)<br><br>Undefined type (a variable that has not been assigned a value has the value undefined)<br><br>NaN (when the result of an arithmetic operation cannot be expressed as a number)<br><br>Symbol type (unique primitive value and may be used as the key of an Object property)<br><br>Object type |
| **Selection Structures**<br>*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.** | **Single-Selection Statement**<br>if (obj !== null)<br>   console.log("the predicate is true");<br><br>**Double-Selection Statement**<br>if (obj !== null)<br>   comsole.log("the predicate is true");<br>else<br>   obj = new Object();<br><br>**Multiple-Selection Statement**<br>if (obj !== null) |

```
      console.log("the predicate is true");
   else if (obj === 2)
      console.log(obj);
   else
      obj = 2;

   switch(num)
   {
      case 1:
         day = "Sunday";
         break;
      case 2:
         day = "Monday";
         break;
      case 3:
        day = "Tuesday";
         break;
      case 4:
         day = "Wednesday";
         break;
      case 5:
         day = "Thursday";
         break;
      case 6:
         day = "Friday";
         break;
      case 7:
         day = "Saturday";
          break;
   }
```

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| **Repetition Structures**<br>*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.*** | ***while* Iteration Statement**<br>`while (i < 10)`<br>`  i++;`<br><br>***for* Iteration Statement**<br>`for (let i = 0; i < 10; i++)`<br>`   console.log(i);`<br><br>***foreach* Iteration Statement**<br>`for (let name of names)` |

| | console.log(name); |
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| | ***do…while* Iteration Statement**<br>do<br>{<br>   console.log(i);<br>   i++;<br>} while (i < 10); |
| **Arrays**<br>*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.)* | let birthday = [6, 2, 1992];<br>let name = ["Carl", "Archemetre"]; |
| **Data Structures**<br>*If this language provides a standard set of data structures, provide a list of the data structures and their Big-Oh complexity.* | **Collection** [*Insert, Access, Search, Delete*]<br>Array [O(n), O(1), O(n), O(n)]<br>HashMap [O(1), O(1), O(1), O(1)]<br>Map (using BST) [O(log(n)), N/A, O(log(n)), O(log(n))]<br>Set (using HashMap) [O(1), N/A, O(1), O(1)]<br>Set (using List) [O(n), N/A, O(n), O(n)]<br>Set (using BST) [O(log(n)), N/A, O(log(n)), O(log(n))]<br>LinkedList [O(n), N/A O(n), O(n)]<br>Stack [O(1), N/A, N/A O(1)]<br>Queue [O(1), N/A, N/A, O(1)] |
| | ```
class Person
{
    this.#name;
    this.#age;
    constructor()
    {
        this.#name = null;
        this.#age = undefined;
    }
    setAge(age)
    {
        this.#age = age;
    }
    setName(name)
    {
        this.#name = name;
    }
    getAge()
``` |

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| | ```
{
    return this.#age;
}
getName()
{
    return this.#name;
}
}


let obj = new Person();
``` |
| **Runtime Environment**<br>*What runtime environment does this language compile to? For example, Java compiles to the Java Virtual Machine.*<br>*Do other languages also compile to this runtime?* | A browser's runtime environment<br>or<br>the Node runtime environment for the purpose of executing JavaScript code without a browser. |
| **Libraries/Frameworks**<br>*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..* | Angular is operated by Google and is implemented to use for developing a Single Page Application (SPA).<br><br>React created by Facebook is used to develop and operate dynamic User Interface of the web pages with high incoming traffic.<br><br>Ember.js supports two-way data binding establishing a reliable platform for handling complicated User Interfaces. Popular websites like LinkedIn, Netflix, Nordstrom use the Ember.js platform for their websites. |
| **Domains**<br>*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.** | JavaScript is the de facto language used by developers for web-based software applications.<br><br>Walmart.com is powered by node.js, ideal for marketplace that require multiple users to be able to access management interfaces simultaneously.<br><br>PayPal uses JavaScript on the front end of their website, the online payment was one of the earliest adopters of node.js, most of what a client see in their account is running on node.js<br><br>eBay began migrating their entire user facing stack to node.js, now just about everything that you interact with eBay is powered by node.js. |