CS 2613 Journal

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Syntax:

Basic syntax that was learned while doing these courses mainly gets divided into 7 types:

1) Variables: ‘var’ in JavaScript was the traditional way of declaring variables in JavaScript but now with the introduction of ‘let and ‘const’, things have been made a bit smoother (in the context of what is getting assigned to the variable.).
2) Data types: JavaScript has mainly 6 primitive data types (‘string’, ‘number’, ‘boolean’, ‘null’, ‘undefined’, ‘symbol’) that we learnt and the ‘object’ datatype was used for arrays, functions and objects respectively.
3) Conditional Statements: These are the same as I learned in my past Java courses. This subtopics scope includes ‘if..else’ and switch statements.
4) Loops: These as well are the same as I learned in my previous Java courses. Using for loops we can produce and perform a number of iterations and using while loops we can perform the iterations when conditions are met.
5) Functions: These are reusable chunks of code that are called using different kinds of arguments. The ‘func’ keyword is used to define functions.
6) Objects: These are used to store and collect key-value pairs. Objects cannot be accessed without using the proper syntax which includes using dot notations or bracket notations.
7) Arrays: These are the most dynamic part of the programming language. They store data and can be modified and accessed using array notations.

From this we learn that a lot of things are different between programming languages that have their basic building blocks same but functionality is different. The unique factor that JavaScript has from other programming languages include dynamic typing, it is a prototype based object oriented programming language and its arrow functions that can be used for anonymous functions.

Data Structures and Libraries:

There are a lot of built in data structures that javascript provides. We learnt a few of them which includes:

1) Arrays: As we saw before, arrays are very dynamic in Javascript. You can add or remove elements as needed. We use various methods like ‘push()’, ‘slice()’ to manipulate and change the contents. These can be nested as well which provides an edge.
2) Objects: These store key value pairs where the keys are strings whose values can be of any data type doesn’t matter. Objects can be used to create constructors, classes etc.
3) Maps: These as well allow us to store key value pairs but in this the value and key can be of any data type.

Under the Hood:

JavaScript is a high-level scripting language used to create dynamic websites and web apps. It's an interpreted language, so no compilation is needed before execution. Browsers can run it directly or Node.js can execute it server-side. JavaScript also has the ability to interface with other languages through its native support for calling functions in C and C++ libraries using WebAssembly API, as well as with other programs and hardware via various network protocols such as HTTP, WebSockets, and TCP/UDP. Furthermore, the language automatically detects unused objects and frees up memory occupied by them; however developers do not have direct access to memory but tools for memory profiling and optimization are available.
Overall, JavaScript is versatile and flexible enough to be used in many contexts and systems.