Java Script Engine

Java script is not any hardware it is also a program which is written in low level language.

Java script run time environment helps us use it in different places. Ex: Inside a fridge, In a TV, In a Browser, In Node.js etc.

Diagram

Description automatically generated

Java script engine takes the human readable code as the input and it goes through three major steps

1. Parsing

2. Compilation

3. Execution

Parsing: During this parsing phase code is broken down into tokens

There is also something known as syntax parser which takes the input code and converts it into abstract syntax tree.

A picture containing graphical user interface

Description automatically generated

The generated AST is passed on to the compilation phase.

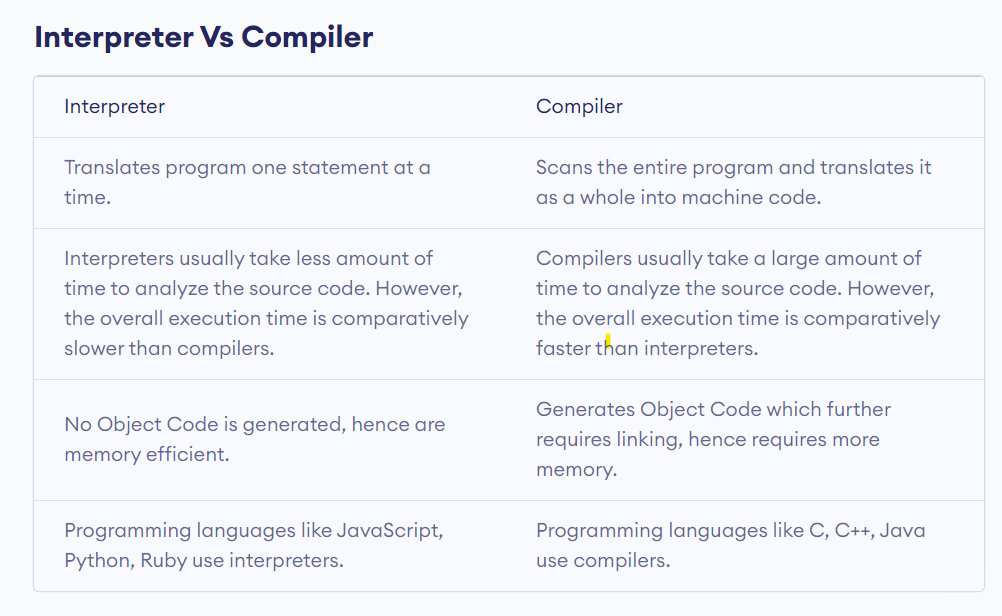
Compilation:

We generally write a computer program using a high-level language. A high-level language is one that is understandable by us, humans. This is called source code.

However, a computer does not understand high-level language. It only understands the program written in 0's and 1's in binary, called the machine code.

To convert source code into machine code, we use either a compiler or an interpreter.

Both compilers and interpreters are used to convert a program written in a high-level language into machine code understood by computers. However, there are differences between how an interpreter and a compiler works.



JIT(Just In Time) Compilation: If the Java script engine uses both interpreter and a compiler we call it a JIT compilation.

Execution: The code is executed in inside a call stack.

Memory heap: This is where all the memory is stored, it is constantly in sync with call stack and garbage collector.

Garbage Collector: It uses Mark & Sweep algorithm to clean up the memory space.

Compiler Optimization: In lining, copy elision, Inline caching.

Diagram

Description automatically generated

Orinoco Garbage collector is used by google V8 and it uses the same Mark & sweep algorithm.

Oilpan is also a garbage collector