

ADDIS ABABA UNIVERSITY

ADDIS ABABA INSTITUTE OF TECHNOLOGY

CENTER OF INFORMATION TECHNOLOGY AND SCIENTIFIC

COMPUTING

Assignment I

Name: Mikiyas Daniel Tefera

Id: ATR/1876/11

Section:It

To: Fitum Almu

January 2020

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# IS JAVA INTERPRETED LANGUAGE IN IT ENTIRETY?

To answer this question we must look at how javascript works in the first place.

## How does javascript work?

For starters, javascript is supposed to run on browsers so for the browser to understand the language it has a javascript engine.

Javascript engine is a program that goes through the javascript code, character by character, and transforms it to a language that the computer CPU understands and executes which is machine code.

The javascript engine executes the javascript line by line which makes it go through the whole code blindly consequently making it redundant and inefficient, which means the javascript engine has to keep retranslating the same code like when you are in a loop which makes the execution slow. This where JIT comes.

### Just-in-time compiler (JIT)

As a way of getting rid of javascript interpreter inefficiency browsers started mixing compilers in.

Different browsers use different ways but the idea is still the same. They added a new part to the engine, called a monitor or also known as a profiler.

The profiler is used to watch the code as it runs making a note of how many times it runs and types used, so at first, the monitor just runs everything through the interpreter.

If the same lines of code are run multiple times the segment of codes is called hot.

When the part of the code is getting the getting very hot the monitor will send it off to the optimizing compiler which will make it complied and stored consequently making a faster version of the code, to do that the compiler has to make some assumptions.

For example, if it can assume that all objects created by a particular constructor have the same shape-that is, that they always have the same property names and that those properties were added in the same order – then it can continue to be true.

But this might not always be true a code can have 99 objects that all have the same shapes, but the 100th might be missing a property.

So the compiled code needs to check before it runs to see whether the assumption is valid. if they are, then the compiled code runs .but if not, the jit assumes that it made the wrong assumptions and trashes the optimized code. which makes the execution go back to the interpreter. this process is called deoptimization.

Even if JIT is supposed to make the code run faster it can cause unexpected performance problems, to avoid that browsers have limits to break out of this optimization. deoptimzation cycle when needed.

## Conclusion

So, in my opinion, even if JIT acts as an optimizer for the javascript code we can't deny the fact that the java engine uses basic definitions of compiled language along the way, which paves the way for usage of both compiled and interpreted, so to address this question javascript isn’t interpreted language in its entirety but **depends on its implantation,** which means it depends on how the java engine choose to implement it, it could be solely interpreted, compiled or both at the same time, which most java engines do nowadays.