Joseph M. Scollo

Abstract:

The following texts will describe six different programming languages and my the reasons for my desire to learn about them. The descriptions will include the creators of the mentioned languages, the influence they have had on other languages, their use cases and prevalence in the world of programming.

JAVA SCRIPT

JavaScript was created by Brendan Eich in 1955. It is currently used in concert with HTML and CSS. As of 2022, 98% of websites utilize JavaScript. JavaScript is serves as an event-driven object oriented language. An event driven language that program flow is determined and reactive primarily to user input. A unique attribute of JS is just-in-time compiled. Instead of being compiled prior to execution, it compiled during runtime. JS falls under the classification of a high level language. In the early years of the world wide web, sites could only be static. The desire to have the ability to create dynamic web sites lead Netscape and sun micro systems implement scripting languages to their browser. This eventually lead to the creation and rise of JavaScript.

Reasons for my interest in JavaScript:

1. At the time of composing this document, my experience is limited as it pertains to scripting languages. It would beneficial to expand my knowledge in this area of programming languages.
2. Already having a healthy knowledge of HTML and CSS, it would be beneficial to add this scripting language to my tool set to enhance my anility in website creation.

C# (C SHARP)

C# is a high level multi paradigm language that at one point was very similar to Java. In recent years both languages evolved to be quite different from one another. C# is cross platformed and very portable. While it wasn't intended to compete with C or assembly language, it makes very efficient use of memory and can run very fast on embedded systems. A unique addition to C# is the null-conditional operator which enables developers to null check in a very precise and efficient way. There are many combinable limited feature languages in the JVM ecosystem. There are not for the .NET framework ecosystem. C# solves this problem with a very robust API and is loaded with enough useful features to not require a vast amount of combinable languages. During the rise .NET, Microsoft's Anders Hejlsberg created C# in the year 2000 to replace SMC (Simple Managed C).

Reasons for my interest in C#:

1. C# is a powerful portable language. My interest in embedded systems has peaked my interest in learning C#. It would be a welcome addition to my knowledge of C and C++.
2. As of 2022 C# software developers are in high demand. Having a solid understanding and being proficient in its use could aid in getting a desired career in software development.

GO

Go is a statically typed multi-paradigm language that serves as an OO, imperative and concurrent language. It was created at GOOGLE by Robert Griesemer, Rob Pike and Ken Thompson in 2009. It's primary objective was to improve the software development space to support multi-core processors. Go's popularity has risen since its inception and is primarily used today in GOOGLE's self-hosting

compiler toolchain. The toolchain targets multiple operating systems and WebAssembly. Go features fast light weight concurrency processes coined goroutines and channels. It also includes a small standard library that includes Mutex and Locks. However, while this language features a robust concurrency library, it isn't the best suited for parallel programming and is prone to data races. Go has received both praise and criticism by the software community.

The interface system, and the deliberate omission of inheritance, were praised by Michele Simionato, who likened these characteristics to those of Standard ML, calling it "a shame that no popular language has followed [this] particular route". -- Wikipedia

Go's *nil* combined with the lack of algebraic types leads to difficulty handling failures and base cases. – Wikipedia

Reasons for my interest in GO:

1. Concurrency and parallelism have always been a fascinating area of computing to me. While I am very familiar with Java's concurrency libraries, it would be advantageous to learn another language that offers concurrent functionality.
2. A lot of companies look for developers that have an understanding in front-end web development. GO is a good language for this purpose, hence my interest in the language.

SCALA

Scala is a high-level, multi-paradigm language that serves as both an object oriented and functional language. It was created to address some of the shortcomings of JAVA. Scala is one of many languages that can be run on a JVM(JAVA Virtual Machine). It can be compiled to java byte code and JavaScript or a direct executable. Scala was designed by Martin Odersky in 2004. A notable feature of the language is it's inclusion of lazy evaluation. It also note worthy that the compilation methods are virtually the same as JAVA's and can be decompiled

to readable JAVA code. Scala features all of the object oriented features as JAVA while offering robust functional capabilities. A short list of examples include: Type inference, Lazy evaluation, Delimited continuations, Higher-order functions, Nested functions, Tuples, etc… While Scala doesn't have as much as a presence as Java and Kotlin, It remains one the top 20 languages as far as popularity is concerned. Scala's most notable use case is with data intensive distributed systems. Both Netflix and Uber use SCALA in some of there operations.

Reasons for my intertest in SCALA:

1. The Java virtual machine has many combinable languages such as Kotlin, clojure, Scala, etc. SCALA's ability to handle big data peaks my interest. It's compatibility with java's compiler makes it a very convenient language.
2. Being Strong as both an object oriented and functional programing language makes it very attractive
3. The fact that companies such as Netflix and Uber use it makes it seem like a language worth learning.

SWIFT

Swift is a multi-paradigm language created at Apple inc. It was designed by Chris Lattner, Doug Gregor, John McCall, Ted Kremenek and Joe Groff in 2014. It's creation was influenced by the replacement of objective C. Swift's primary use case is for software development for apple products such as: iOS applications for iPhone, iPad and apple watch. Also MacOs for desktops, notebook computers, and apple tv. Due to the improvements made with SWIFT one could code a software application with half the code it would take to write in objective-c and will run up to 2.6 times faster. Upon its initial release it only ran on mac OS. It can now run on both Linux and Windows platforms. Swift was created taking ideas from multiple languages including Java, Clojure, C, C++, C#, Python, Scala and many more.

Reasons for my interest in Swift:

1. I have always had an interest in developing iPhone apps. It was this initial interest that prompted me to return to college at 32 and get a bachelors in computer science.
2. With Swift being available for both Linux and Windows it will likely start to pick up more use cases as newer releases come available.
3. Having the ability to develop applications for Apple opens up more career opportunities.

FORTRAN

Created by John Backus at IBM in 1957, this imperative language is the Godfather of all modern languages. It directly influenced the creation of BASIC and C. Before the days of text editors, IDEs, and disk files, Fortran used 80 column punch cards to run programs. Each card could hold twelve 36 bit words. Fortran is a powerful language used mainly in numeric and scientific computation. Fortan's first major revision was in 2003. Fortran now has more modern capabilities like processing floating point numbers and parallel computing. As of 2018 Fortran has interoperability with C. Fortran has countless use cases such as: astronomy, climate modeling, computational economics, computational physics etc…

Reasons for my interest in Fortran:

1. Due to the almost limitless use cases for Fortran, having it in one's programming tool box will only open up more opportunities.\
2. A desire to learn one of the first languages that inspired all other languages!