

EFFECTIVENESS OF PROGRAMMING LANGUAGES IN CURRENT TRENDS

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ABSTRACT

The purpose of this study is to improve the better understanding about the different programming languages which are in current usage by maximum of software developers in the world. Programming is one of the core skills required by most well-paying IT jobs today. We have assumed that each reader is familiar with at least one of the programming languages, for example, C/C++ and has written basic programs in that language. We hope that the assumption is true for the greater majority and we will therefore proceed to that basis. The incremented list of programming languages and protocols can make it tough for developers and coders to select any one of the languages that's most suitable for their career or jobs. This study analyzed the effectiveness and usage of different programming languages and provide a clear insight into choosing the exact programming language that could be satisfy their future goals. Coding skills are especially a gem in the Information Technology, data analytics, research, web scraping, web designing, and engineering segments. So, which programming language should one know to pursue their dream career? This article focusing on a small compact set of trends involving some high-level programming languages. We quantified many of their relevant factors, and then collected data on their usage over a decade. We have chosen the coding languages like Rust, Ruby, Go, Objective-C, Python, JAVA, PHP, JavaScript, etc., we have provided the properties like case sensitiveness, platform dependency, motive of development, usage in fields, security state, extensions, etc.,

Keyword: - Programming languages, application, case sensitiveness, platform dependency, current technologies.

1. INTRODUCTION

Programming is very essential when it comes to learning how to innovate, create very eco-friendly solutions for global problems. It helps in speeding up the input and output processes in a machine. Additionally, it helps one to develop the ability to automate, collect, manage, analyze the data and information correctly. There are many types of programming sectors, and very few firms do them all. Some firms develop desktop applications as software solutions, others mobile applications and others web applications. Within these categories there are different sub-categories, tool sets and programming languages. Choosing the best programming language is a part of knowing, why programming is the skill you have to learn. In this article we have provided few programming languages with their area of application, properties and relevant data, such that it is useful to choose the needed programming language that could be most suitable for your carrier.

2. PYTHON PROGRAMMING LANGUAGE

Python is a great language for the beginners. It is created by Guido Van Rossum in 1991. Python is considered a scripting along with copyrighted language, an interpreted high-level programming language designed to be easy to learn syntax emphasizes readability, reduce the cost of program maintenance and supports modules and packages especially dynamically typed and garbage-collected. Python 3 version is the recent update which is working well. The wide usage of this language is to create web applications and dynamic web content. The file extensions used to compile programs in Python (.PY) and also be saved as a compiled program (.PYC files). Some changes make Python to be programmed in object-oriented mode even easier when they knew the library called "Attr" [1]. Python supports Python API include GIM, INKscape, Blender and Autodesk Maya.

2.1 THESE ARE SOME REAL-WORLD PYTHON APPLICATIONS:

- Desktop GUI Applications.
- Web and Internet Development.
- Science Numeric.
- Software Development.
- Education.
- Database Access.
- Network Programming.
- Games and 3D Graphics

3. JAVA PROGRAMMING LANGUAGE

Java is a high-level programming language with platform independent, multithreaded, secured, dynamic, object oriented, portable, robust, distributed, high performance. "Java has its own runtime environment called "JRE"" [2]. Java was designed by "Green teams" named James Gosling, Mike and Patrick at Sun Microsystems (which has since been acquired by Oracle) and released in 1995. It initially, called "Green Talk" after called "Oak". Java has had a good reputation as a multipurpose programming language" [5]. Java programming is highly used for desktop, web, mobile app, and android development, robotics, embedded system, games, mobile devices etc. Java applications are compiled to Bytecode that can able to run on any Java Virtual Machine (JVM) regardless of the underlying computer architecture. According to GitHub, particularly popular for client-server web applications. The file extensions are .java, .class, .jar

3.1 THESE ARE SOME APPLICATIONS OF JAVA PROGRAMMING LANGUAGE:

- Mobile Applications.
- Desktop GUI Applications.
- Web-based Applications.
- Enterprise Applications.
- Scientific Applications.
- Gaming Applications.
- Big Data technologies.
- Business Applications.
- Distributed Applications.
- Cloud-based Applications.

4. GO PROGRAMMING LANGUAGE

Go is a procedural programming language. It is structured at Google in 2007 by Robert Griesemer, Rob Pike and Ken Thompson. Go is an open source like backend programming language. Its area name is "golang.org" [3]. Its

runtime effectiveness and static composing (like C++), clarity and ease of use (like Python and JavaScript), elite systems administration and multiprocessing. It is anything but difficult to assemble straightforward, dependable and proficient programming. Go is impacted by C, with memory wellbeing, basic composing, trash assortment and multi-worldview. Projects are gathered by utilizing bundles, and furthermore bolsters condition embracing designs the same to dynamic dialects (eg: type interface x: =0, rather than this `int x=0`). Its aggregation time is exceptionally quicker than other programming dialects. The bundles circulated with this programming language is very helpful however Go isn't so object situated in the customary sense.

5. RUST PROGRAMMING LANGUAGE

Rust was developed by Graydon Hoare (Mozilla employee). Rust is a new language relative to its predecessors (essential in C, which preceded it by 38 years) and an open source systems programming language. It supports multi-paradigm (object oriented, concurrent, functioning, imperative, generic, structured) programming languages. The syntax of Rust is derived from C and C++ but difference in semantics in addition with, it is a backend programming language. It focuses on security, control over the layout of memory, prevents almost all crashes, fast growing community, in addition to provides memory safety without using garbage collection (not allow null or pointers) [4]. The 183 companies use rust in their Tech Stacks, Dropbox including Sentry, Postmates, Klarna, Aracix etc. According to companies, whether it will be storing the data on the stack or on the heap and determines at compile time.

6. PROGRAMMING LANGUAGES FOR WEB APPLICATIONS

6.1 JAVASCRIPT:

JavaScript (JS) is a lightweight, deciphered, object arranged language with top of the line capacities and most popular as the scripting language for website pages, yet it's utilized in numerous non-program situations too. JavaScript runs on the customer side of the web and supporting model-based item development. Generally utilized for structure and controlling page conduct. As opposed to mainstream confusion, JavaScript isn't "Deciphered Java"[6]. It can work as both a procedural and an article arranged language. The essential syntax is purposefully like both Java and C++ to lessen the quantity of new ideas required to become familiar with the language. JavaScript projects can decompile work bodies again into their source text.

6.2 TYPESCRIPT:

TypeScript is an open-source programming language structured and kept up by Microsoft. It is a severe grammatical superset of JavaScript and adds discretionary static composing to the language. TypeScript is intended for improvement of enormous applications and trans compiles to JavaScript. As TypeScript is a superset of JavaScript, existing JavaScript programs are likewise legitimate TypeScript programs. "TypeScript might be utilized to create JavaScript applications for both customer side and server-side execution (as with Node.js or Deno)"[7]. It's referenced among the five most encouraging dialects in 2020. Precise, one of the biggest frontend systems, is utilizing TypeScript. About 60% of JS software engineers as of now use TypeScript, and 22% wish to try. From no place, TypeScript is presently in the seventh situation in GitHub pull demands for Q1 2020, above PHP and C. (Source)While an extensive reason for this is the help of TypeScript by organizations like Microsoft (which made it) and Google, it is upheld for a decent reason. Since JavaScript is a subset of TypeScript, you can utilize all JavaScript libraries and code that you need in your TypeScript code. Most well-known JavaScript libraries have types in 2020 – Definitely Typed is a vault with types for a variety of JavaScript libraries that you can use to make your connections with them more sort safe[7]. This implies that you can step by step embrace TypeScript in your JavaScript codebase.

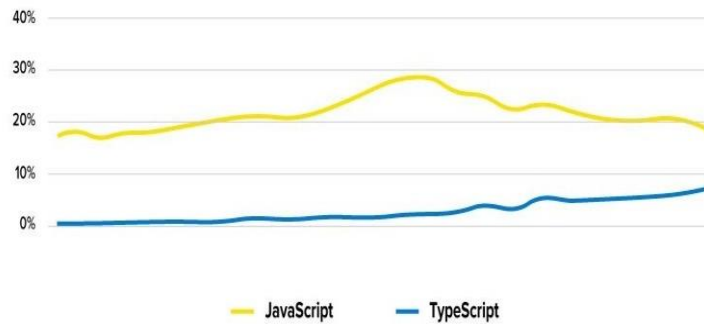


Chart -1: JavaScript vs TypeScript

6.3 PHP:

PHP (Hypertext Preprocessor) is a widely used open source and scripting language that is especially suited for server-side web development and code to be embedded in HTML. PHP generally runs on a web server. It was originally designed by Danish-Canadian programmer Rasmus Lerdorf in 1994 and developer, The PHP Development team, Zend Technologies. Nowadays, the PHP reference implementation is produced by The PHP group. The filename extensions defined .php, .phtml, .php3, .php4, .php5, .php7, .phps, .php-s, .pht, .phar. PHP can also be interpreted and executed via Command-Line Interface (CLI) [8]. Unlike function and class name, variable names are case sensitive.

6.4 RUBY:

Ruby is a deciphered, significant level, unadulterated Object arranged, center around effortless and efficiency, broadly useful programming language. It was structured and created in the mid-1990s by Yukihiro Matsumoto in Japan. Ruby is progressively composed and it utilizes trash assortment. It is usage language of C alongside, filename expansions (.rb). RubyGems gives a standard course of action to Ruby undertakings and libraries. Broadly utilized for building web applications and others too like information investigation, prototyping. Ruby and Python are fundamentally the same as dialects, ceaselessly it is backend programming dialects. The target, to make it go about as a reasonable cushion between human software engineers and fundamental figuring hardware. It bolsters all the stage (Windows, Linux, Mac), easy to learn as a result of comparative punctuation with brief code.

6.5 NODE.JS:

Node.js is a server-side stage dependent on Google Chrome's JavaScript Engine (V8 Engine). Node.js was made by Ryan Dahl in 2009 and its latest version is v0.10.36. Node.js is a phase dependent on Chrome's JavaScript runtime for viably developing snappy and flexible framework applications [9]. Node.js uses an event driven, non-blocking I/O model that makes it lightweight and successful, perfect for data raised consistent applications that unearth scattered devices. Node.js is an open source, cross-stage runtime condition for making frameworks applications. Node.js applications are written in JavaScript, and can be run inside the Node.js runtime on OS X, Microsoft Windows, and Linux. Node.js furthermore gives a rich library of various JavaScript modules which improves the headway of web applications using Node.js to an unbelievable extent. Node.js, a JavaScript runtime dependent on the JavaScript V8 engine of Chrome, uses an event driven and non-blocking I/O model which makes it viable and lightweight. With one of the greatest open source libraries condition over the globe, Node.js has become the product specialists' and website specialists' top pick. Node.js will continue getting acclaim and will wind up being among the latest web programming designs.

7. OBJECTIVE-C

Objective-C is a vigorously object-Oriented programming language. It was structured by Brad Cox and Tom Love. Utilized for composing programming to determine OS X and iOS working framework their particular APIs, Cocoa and Cocoa contact[10]. The filename expansions are .h, .m, .mm,.M. The language structure is like C yet has little changes on it. Objective-c usage utilize a dainty runtime framework written in C. This is the fundamental language utilized by Apple, further extraordinary numerous highlights that, utilized in iOS-explicit portable application improvements and incredible for memory the executives. In spite of mainstream thinking, Objective-C wasn't designed by, nor is it only possessed by Apple.

8. DOCKER

Docker is a tool intended to make it simpler to make, convey, and run applications to utilizing holders. Holders permit a designer to bundle up an application with the entirety of the parts it needs, for example, libraries and different conditions, and boat everything out as one package. Docker compartment is an open source programming advancement stage. Its fundamental advantage is to bundle applications in "compartments," permitting them to be convenient among any framework running the Linux working framework (OS)[11]. Docker Hub is a cloud-based library administration which permits you to connection to code archives, construct your pictures and test them, stores physically pushed pictures, and connections to Docker Cloud so you can convey pictures to your hosts. In straightforward terms, Docker is utilized for firmly bundling a product application and the conditions which bolster it, together. This bundled item is known as a Container. Since it is finished by Docker, it is called Docker container. Since the application and its conditions are bundled together, there is no outside reliance for the application to run[11]. This implies, the compartment is light-weight. Because it is light-weight, it very well may be handily transported to different machines and be executed on those machines, regardless of their host OS/configurations. The just prerequisite being, Docker must be installed to run that application living in the holder.

9. SWIFT

Swift is a broadly useful, multi-worldview, assembled programming language created by Apple Inc. for iOS. It is profoundly impacted by Python and Ruby that is quick, secure, and simple to-learn. Possessing to its adaptability and down to earth applications, Swift has supplanted Objective-C as the fundamental language for Apple-related applications. Further, since Swift is advanced by Apple, its notoriety and network support is expanding. Actually, an investigation of the best 110 applications on the application store demonstrated that 42 percent of applications are as of now utilizing Swift. Coders with little or zero experience can utilize Swift Playgrounds to gain proficiency with the language, try different things with complex codes, and work on local iOS and macOS applications. Quick is the debut coding language that assists engineers with making iOS applications inside a brief timeframe[12]. The programming language opens a few open doors for new software engineers, permitting them to become wildly successful in the realm of application advancement. There is a monster advertise out there for iOS and you unquestionably need to be a piece of it. On the off chance that you are peering toward this blossoming market.

10. C# PROGRAMMING LANGUAGE

"C# is a broadly useful and Object Oriented programming language articulated as "C Sharp""[13]. It was created by Microsoft drove by Anders Hejlsberg and his group inside the .NET activity and was affirmed by the European Computer Manufacturers Association (ECMA) and International Standards Organization (ISO). C# is among the dialects for Common Language Infrastructure. C# is a ton like Java linguistically and is simple for clients who know about C, C++ or Java[7]. Hacker Rank has distributed its 2020 Developer Skills Report, which shows C# making strides in the rundown of "most popular" programming dialects for 2020. The ease of use and adaptability of C# have made it a hit among the designers. C# is additionally one of the most famous programming dialects among game engineers, and is required to keep up its prevalence in 2018 and past also.

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12. REFERENCES

- [1]. Shell, Scott (17 June 2014). "[An introduction to Python for scientific computing](#)" (PDF). Retrieved 3 February 2019.
- [2]. Gosling, James; McGilton, Henry (May 1996). "[The Java Language Environment](#)". *Archived* from the original on May 6, 2014. Retrieved May 6, 2014.
- [3]. Kincaid, Jason (November 10, 2009). "Google's Go: A New Programming Language That's Python Meets C++". TechCrunch. Retrieved January 18, 2010.
- [4]. Hoare, Graydon (2016-12-28). "[Rust is mostly safety](#)". Graydon2. Dreamwidth Studios. Retrieved 2019-05-13.
- [5]. [TechGigBureau](#) , "Top 5 programming languages for backend web development", 31 December 2018, 11:00 PM.
- [6]. Mahemoff, Michael (17 December 2009). "[Server-Side JavaScript, Back with a Vengeance](#)". readwrite.com. Retrieved 2016-07-16.
- [7]. Baxter-Reynolds, Matt (1 October 2012). "[Microsoft TypeScript: Can the father of C# save us from the tyranny of JavaScript?](#)". [ZDNet](#). Retrieved 26 April 2015.
- [8]. Lerdorf, Rasmus (2007-04-26). "[PHP on Hormones – history of PHP presentation by Rasmus Lerdorf given at the MySQL Conference in Santa Clara, California](#)". The Conversations Network. Retrieved 2009-12-11.
- [9]. Schlueter, Isaac (15 January 2014). "[The Next Phase of Node.js](#)". Retrieved 21 January 2014.
- [10]. Biancuzzi, Federico; Warden, Shane (2009). [Masterminds of Programming](#). [O'Reilly Media, Inc.](#) pp. 242–246. [ISBN 978-0-596-51517-1](#). *Archived* from the original on February 17, 2017. Retrieved July 22, 2016.
- [11]. Guthrie, Scott (October 15, 2014). "[Docker and Microsoft: Integrating Docker with Windows Server and Microsoft Azure](#)". ScottGu's Blog. Microsoft. Retrieved January 12, 2015.
- [12]. Kremenek, Ted (March 25, 2019). "[Swift 5 Released!](#)". Swift.org. Retrieved March 28, 2019.
- [13]. Hamilton, Naomi (October 1, 2008). "[The A-Z of Programming Languages: C#](#)". [Computerworld](#). Retrieved October 1, 2008.