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## Survey on Significance of Programming Languages

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### Abstract

Comparison of programming languages is a common topic of discussion over software engineers. Multiple programming languages are specified, designed, and implemented in each year in order to keep up with the varying programming paradigms, growing hardware, etc. In this paper we are giving a comparative study between six programming languages: C, C++, PHP, C#, Python, Java; These languages are distinguish under the characteristics of reusability, reliability, portability, availability of compilers and tools, readability, efficiency, familiarity an expressiveness .In 21st century of modern age almost everything has become digital i.e. computerized every work is done on a computer actually it is used to store data in various forms. So the related application is developed because of which manual work decreases. To create any application, programmer have the knowledge of languages due to which it is created. There are various languages which has various function each language has its own feature we are studying the language but we actually don't know what use of language is and why we are learning it and when the language is used.

**Index Terms:** interpreter, assembler, kernel, and toggle.

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### 1. Introduction

Programming languages are incredible and interesting field of study. Computer programmer tend to create new programming language. Thousand different languages have been made in the last few years. Some languages earns wide popularity and others introduce new features. Each language has its advantages and disadvantages. The existing work provides a comparison of various properties, paradigms, and features used by all of popular programming languages: C, C++, PHP, C#, Python, Java. With these variety of language and their wide use, software designer and programmers should to be aware of the advantages and drawbacks each language could bring to their software solution and be careful when they make logical decisions. These languages are co-relate under the features of reusability, reliability, portability, Availability of compilers and tools, readability, efficiency, familiarity and expressiveness. Other conditions like

The programming efforts, run time efficiency, memory consumption, and database connectivity are impart by implementing and executing the same bunch of programs using all the languages under study.[1]

### 2. History of Programming Language

Computer programming is important in our world today, executing the systems for every device we use. Computer programming languages permit us to tell machines what to do. Machines and humans “think” in very different manner, so programming languages are essential to bridge that gap.

**1972:** C: Invented by Dennis Ritchie at Bell Labs, C is used by many to be the first high-level language. A high-level computer programming language is nearer to human language and more moved from the machine code. C was designed so that an operating system called Unix could be used on many types of computers. It has manipulate many other languages, including C#, C++, Java, JavaScript, PHP, and Python.[2]

**1983: C++:** C++ is an extension of the C language and was introduced by Bjarne Stroustrup. It is used all over the world. C++ is used in high-performance software like Adobe Photoshop and in game engines. Still most packaged software is written in C++.

**1995: PHP:** designed by Rasmus Lerdorf, PHP is used mostly for Web development and is usually executed on Web servers. It originally stands for **P**ersonal **H**ome **P**age, as it was used by Lerdorf to control his own online information. PHP is now widely used to construct websites and blogs. WordPress, a popular website creation tool, is written with the help of PHP.

**2000:C#:** created by Microsoft with the goal of combining the computing power of C++ with the simplicity of Visual Basic, C# is located on C++ and is similar to Java in many ways. It is used in almost all Microsoft products and is primarily used for creating desktop applications.

**1991: Python:** developed by Guido Van Rossum, Python is simple to read and requires fewer lines of code than many other programming languages. It was named after the British comedy group Monty Python. Famous sites like Instagram use frameworks that are coded in Python.

**1995: Java:** native as Oak, Java was invented by Sun Microsystems. It was known for cable boxes and hand-held devices but was later enhanced so it could be used to share information on the World Wide Web. Java is all over used, from computers to smartphones to parking meters. Three billion devices execute Java!

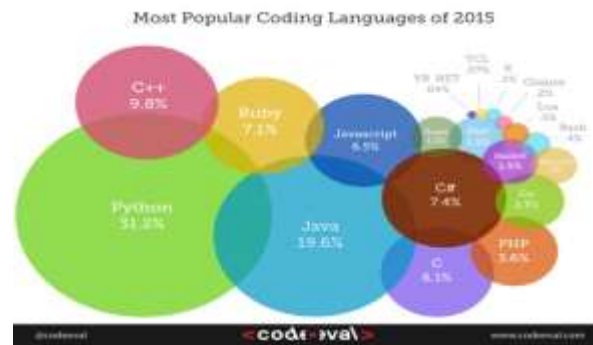
### 3. Programming Language

A programming language is a computer language engineered to create a standard form of instructions. These commands can be compiled into a code understood by a machine. Programs are constructed through programming languages to manage the working and output of a machine through accurate algorithms, same as to the human communication process. A programming language is also called as a programming system, computer language.

### 4. Various programming languages

There are various programming languages which are as follows:-

- C
- C++
- PHP
- C#
- Python
- Java



**Fig-1: various Programming Language**

#### 4.1 C language

Even though so many computer languages are used for writing computer applications, the computer programming language, C, is the most famous language worldwide. Each of the things from microcontrollers to operating systems is coded in C since it's very flexible and multiskilled, permits maximum control with minimal commands. If you want a career in computer programming, it would be good to start by learning the C programming language.

C programming is examined as the base for other programming languages, that is why it is known as mother language.

It can be defined by the following ways:

- Mother language
- System programming language
- Procedure-oriented programming language
- Structured programming language
- Mid-level programming language

#### 1) C as a mother language

C language is examined as the mother language of all the modern programming languages because most of the compilers, JVMs, Kernels and so many, are written in C language, and most of the programming languages follows C syntax. It gives the main concepts like the array, strings, functions, file handling, etc. that being used in many languages.

#### 2) C as a system programming language

A system programming language is used to design system software. C language is a system programming language because it is being used to do low-level programming. It is generally used to create hardware devices, OS, drivers etc.

It cannot support internet programming like Java, .Net, PHP, etc.

#### 3) C as a procedural language

A procedure is called as a function, method, routine, subroutine, etc. A procedural language designate a series of steps for the program to solve the problem.

#### 4) C as a structured programming language

A structured programming language is a part of the procedural language. Structure means to split a program into parts so that it may be simple to understand and modify.

### 5) C as a mid-level programming language

C is examined as a middle-level language because it supports the characteristics of both low-level and high-level languages.[3]



**Fig-2 : c language**

C Program

File: main.c

```
#include <stdio.h>
```

```
int main() {
printf ("Hello C Programming\n");
Return 0; }
```

### 4.2 C++

C++ is based on the C language, and it was invented in early 1980's by Bjarne Stroustrup at *AT&T Bell Laboratories*. Here “++” denotes extension because “++” is a syntactic construct used in C *to increment a variable*. Most of the C++ content is the super-set of “C”, Due to this extension most C programs can be compiled with the help of a C++ compiler. A C++ program is a set of commands, which gives command to the computer to do “something.” This set of commands is usually called *C++ source code*. C++ is the Mid-Level programming language because it has the feature of Low level as well as high-level programming language. Using C++ Programming Language we can create various Software,[4] *These are:*

- System software
- application software
- device drivers
- embedded software
- high-performance server and client applications and
- entertainment software such as video game

#### Applications of C++

With the help of C++, you can design system software as like OS, Device Drivers, Network(N/W) protocols, PC utilities .Application software you can make application like

- Database
- Word processing
- Spreadsheets
- C++ is a better programming language than ‘C’ programming language.
- Because it is suitable for developing any software.
- Character user interface (CUI).

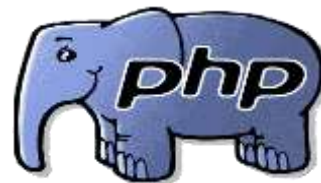
### 4.3 PHP

PHP was developed by a developer Rasmus Lerdorf, in the year 1994.PHP is an HTML-embedded scripting language. Abundant of its syntax is borrowed from C, Java and Perl with a couple of exclusive PHP-specific features thrown in it.The objective of the language is to allow web developers to write progressive generated pages quickly.

PHP stands for PHP: Hypertext Preprocessor. This flusters many people because the starting word of the acronym is the acronym. This form of acronym is termed as a recursive acronym. PHP/FI 2.0 is a bit previous and no longer backed version of PHP. PHP 3 is the follower to PHP/FI 2.0 and is a lot superior. PHP 7 is the current generation of PHP, which uses the engine 3 which, amongst other things, offers many supplementary OOP features.[5]

If you are familiar with other server side language like ASP or JSP you might be admiring what makes PHP so unique, or so distinct from these competing options well, here are some basic reasons:

1. Performance
2. Portability (Platform Independent)
3. Ease of Use
4. Open Source
5. Third-Party Application Support
6. Community Support



**Fig-3:PHP**

### 4.4 C#

C# is broadly used to create games using the Unity game engine, which is the trendiest game engine today. More than a third of top games are made with Unity, and there are almost 770 million active users of games designed using the Unity engine. Unity is also used for VR, with 90% of all Samsung Gear and 53% of all Oculus Rift VR games generated using Unity .C# is a very well-known tool for generating these applications, and so makes a great option for any programmer hoping to break into the game development industry, or for anyone involved in virtual reality.

**Today, it is the 4th most in demand programming language**, with approximately 31 % of all developers using it frequently. It is also the 3rd largest community on Stack Overflow (which was built using C#) with more than 1.1 million topics .This popularity converts into thriving job market—more than 17000C# jobs are advertised every month (globally) with an average salary of more than **\$72,000** . Shortening down to the US only, there are more

than **6,000** jobs announced each month with an annual salary of **\$92,000**.

#### Applications of C#

- C# is object oriented language which is a style of programming that bears a lot of its own advantages.
- Productivity
- Versatility
- The most powerful programming language for the .NET Framework, with the help of Visual C++ and a refreshed common language runtime (CLR), a virtual machine component that executes all programs written for .NET[5]



**Fig-4:C#**

#### 4.5 Python

Development of area range of application from beginner-level programmers and carry the Python is used for general-purpose, high level programming language. It was initially recognized by Guido van Rossum in 1991 latter developed by Python Software Foundation .Python is interpreted: Python is processed and executed by the interpreter. You do have compulsion to compile your program before executing it. Python is Object-Oriented. It was mainly expand for concentrate on code readability, and its syntax permit programmer to show concepts in fewer lines of code. Python is used in many applications domain .python standard library support many Internet protocols such as HTML, XML, JSON,E-mail processing FTP, IMAP. Python is used in Areas of Customer Relationship Management Content & Document Management, Energy Conversation, E-commerce Enterprise Resource Planning, knowledge management, manufacturing product development, project Management Quality control online analytical Processing Risk management and simulation In Network programming, Python is used to control Firmware updates [7].Python is a Beginner Language: Python is a great language for the Beginner-level programmers and carry the features are:

- Cross Independent Language
- Free and Open source
- Interpreted
- Interactive

- Beginners and portable

#### Python code:

```
Print('hello')
```



**Fig-5: Python**

#### 4.6 Java

Java is a high-level programming language Originally elaborated by Sun Microsystems and released in 1995. Java runs on a different

Platforms, such as Windows, Mac OS, and the various versions of UNIX .Java is defined as object-oriented language to C++, but simplified to eliminate language characteristics that cause Common programming errors. The source code file are compiled into a format called byte code, which can then be executed by a java interpreter.

Compiled Java code can run on most computers because Java interpreters and runtime environments, known as Java Virtual Machines (JVMs), exist for most operating systems, including UNIX, Macintosh OS, and Windows. Bytecode can also be converted into machine language instructions by a just-in-time compiler. In 2007, most Java technologies were released under the GNU General Public License. As a general purpose programming language, Java provides a number of features that make the language well suited for use on Web. Small Java applications, called applets, can be downloaded from a web server can be run on your computer by a Java-compatible Web browser. Applications and websites using Java will not work unless Java is installed on the device.[8] Advantages are as follows:

- Secured
- Robust
- Portability
- Extensibility

#### Java code:

```
Class A{
    Public static void main (String args[])
    {
        System.out.println ("Hello World");
    }
}
```



Fig 6-Java programming

5. COMPARISON TABLE

1. Comparison between C and C++

C Language	C++ Language
C was developed by Dennis Ritchie between 1969 and 1973 at AT&T Bell Labs.	C++ was developed by Bjarne Stroustrup in 1979 with C++'s predecessor "C with Classes".
C supports procedural programming paradigm for code development.	C++ supports both procedural and object oriented programming paradigms; therefore C++ is also called a hybrid language.
C does not support object oriented programming; therefore it has no support for polymorphism, encapsulation, and inheritance.	Being an object oriented programming language C++ supports polymorphism, encapsulation, and inheritance.
In C (because it is a procedural programming language), data and functions are separate and free entities.	In C++ (when it is used as object oriented programming language), data and functions are encapsulated together in form of an object. For creating objects class provides a blueprint of structure of the object.
C does not provide direct support for error handling (also called exception handling)	C++ provides support for exception handling. Exceptions are used for "hard" errors that make the code incorrect.

2.Comparison between Python and Java

Technology	Python	Java
Popularity	Popular	Very popular
Syntax	Easy to learn and use	Complex includes learning curve
Performance	Slower than java in various implementations	Relatively very fast
Cross Platform	Yes	Yes, thanks to the JVM
Backend Framework	Django, Flask	Spring ,Blade
Machine Learning Libraries	Tensorflow ,pytorch	Weka Mallet ,Deeplearning4j,MOA
Game Development Engine	Cocos panda3d	JMonkeyEngine

3.Comparison between PHP and C#

C#	PHP
It is object oriented ,modern ,general-purpose language developed by Microsoft	It is language which is used in server side scripting language also easy to learn and developed by Rasmus Lerdorf
With ASP core you are no longer just limited to window ,so a language seems to be worth learning	In Php people love frame work and framework with such as laravel, you can build a web app or API really fast (facades, ORM, scaffolding etc.)
Supports many platform windows ,Linux	Use by most common CMS platform
Current stable version 7	Current stable version

### CONCLUSION

Now we have known why we are studying programming languages not just only to write program and designed software but for many other things also. The reason behind this presentation is to convey what are the individual characteristics and function of each language. And why c is must come before any other language.

### REFERENCES

- [1] <https://www.geeksforgeeks.org/introduction-to-programming-languages>
- [2] <https://medium.com/commitlog/a-brief-totally-accurate-history-of-programming-languages-cd93ec806124>.
- [3] <https://medium.com/commitlog/a-brief-totally-accurate-history-of-programming-languages-cd93ec806124>.
- [4] <https://www.studytonight.com/c/features-of-c.php> .
- [5] <https://www.programiz.com/cpp-programming>.
- [6] [https://www.slant.co/versus/115/125/~c\\_vs\\_php](https://www.slant.co/versus/115/125/~c_vs_php).
- [7] <https://www.geeksforgeeks.org/python-programming-language/>.
- [8] [https://www.tutorialspoint.com/java/java\\_tutorial.pdf](https://www.tutorialspoint.com/java/java_tutorial.pdf).