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C, C++ and JAVA: The Magic of Computer Programming Language

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Abstract:- This paper is all about to do the basic study of the programming language. It is very necessary to have basic ideas of the languages i.e C, C++ and JAVA to learn new innovative technologies. The C language was introduced in 1970s to make a program on the computer which can be run very easily. This need led Ritchie to develop the programming language called C[2]. Later on the speed to work changed and people want everything to get their work faster and hence C++ language was introduced which literally means increment of C by 1[1]. The purpose of C++ is to make writing good programs easier and more pleasant for the individual programmer. But the problem was that the program was unable to run on other system and was not more secure and hence a language called Java was introduced to implement a virtual machine with programming language to support platform independency, secure, and fast.

In this paper we are going to have detail study about the computer languages which are essential for the computer engineer to make the program logic easy to implement.

Keywords:- *C, C++, Java, Compiler, Program, programming language, develop, advantages, disadvantages, purpose.*

I. INTRODUCTION

People are eager to know about the C programming language. Dennis Ritchie was the founder of C which was designed and implemented on Unix OS on DEC PDP-11. This C language was originally developed from the old language BCPL which was developed by Martin Richards. C language influenced a B language, developed by Ken Thompson in 1970s[2]. A committee was established in Summer 1983 to create ANSI (American National Standards Institute) standard that defines C language. When the work was started, Superset of C language was introduced and known as "c with classes". He tried to implement C language into CPP which includes Object Oriented Programming[1]. This language added classes, inlining function, inheritance, default function, arguments and also different features of CPP language. The first compiler of c with classes is known as Cfront. This Cfront was derived from CPre which is C compiler. Ordinary C was converted to C with Classes by using this programs[2]. In C with Classes, mostly Cfront was written by making it a self-hosting compiler. The compiler that can compile itself was known as self-hosting compiler. There was a big impact on the implementation of future compilers and also on the Unix operating system because of Cfront. Java was begined as a project. This project is known as "Oak" and was introduced by James Gosling[4]. He thought to make language that was similar to C-like notation and had more uniformity and simplicity than Java so he implemented Java Virtual Machine. In 1995, the first implementation on Java was Java 1.0. It gave the statement "Write Once, Read Anywhere"[4]. It could be on popular platform with free runtimes. Its security was configurable so it was pretty secured but allowing for network and also file access to be limited. Using advent of "Java 2", new version of huge and small platforms i.e. J2EE and J2ME were developed[4].

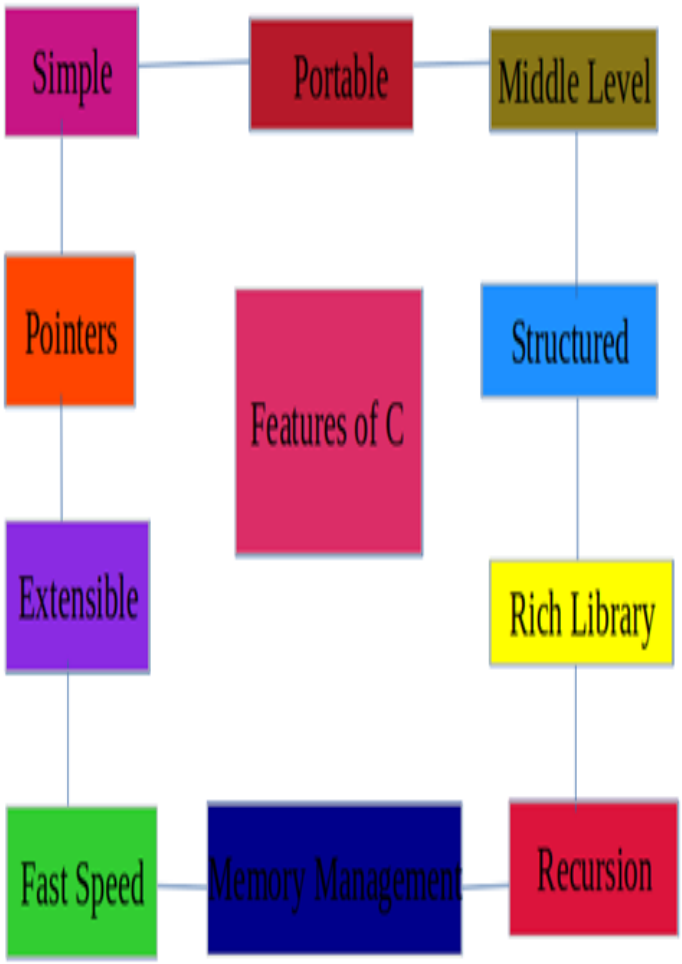

Fig 1

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II. LITERATURE

The C programming language come into the existence C in 1972 at Bell Labs. He caused revolution in computing world by publishing "The C Programming Language"[2]. Before writing C language, he worked with other employees of Bell Labs (AT & T), on a project called Multics with the goal to develop multiuser operating system for large computed hence the employees to work on other project. A Danish computer scientist started working on "C with classes", the pre-processor to C in 1979[2]. He added the new features to C and named it as C++[1]. Many other programming languages have been influenced by C++ with Java, D, #C and other new versions of C. After the development of C, C++20 is the next planned standard thereafter. It is the general purpose programming language with imperative, object oriented and generic programming features with low level memory manipulation. It is a compiled language available with many other platforms. C++ is considered as a best programming language in 2017. The history of Java is quite interesting to know[4]. It was designed for interactive televisions. At the time, it was the advanced technology for digital cable television industry. Its history began with Green Team and its members (also known as Green Team) to start a project for development of digital devices as setup box etc[4]. Netscape incorporated the Java technology. James Gosling along with Mike Sheridin and Patrick Naughton started java language in June 1991. Originally it was called "Greentalk" and the file extension was .gt but later on named "Oak". They named Oak because it was a symbol of strength and the name of national tree of different countries such as U.S.A., France, Germany, Romania, etc. Oak was renamed as "JAVA" in 1995[4]. There are many versions of Java JDK Alpha and Beta, JDK 1.0, JDK 1.1, J2SE 1.2 , and so on. The latest version of Java is Java SE 10.

III. COMPARATIVE STUDY

There are many features along advantages and disadvantages of using C language. Let us study them:

C was a robust language which consist of built-in functions and also operators is used for writing any typical program[5]. The capabilities of assembly language were combined by C compiler along with the features of high level language. We know that, C language is faster than the BASIC and efficient due to data types and operators. C is very highly portable language as it runs on any machine without any modification. It can extend itself. It supports different functions and that collection is supported by C program[5]. C languages are used by Operating System and Embedded System. The C is known as the basic building block with different data types and powerful operators which made this language efficient and faster in execution. If we make a change in the program, then it can run on other system also which tells us that it is highly portable language. ANSI C consist of 32 keywords. The large number of availability of functions made the task of the program simple. It is purely structured programming language that made the user to have solution on the problem with the help of functions. The collection of complete program is modules. These modules made the program debugging, testing and easy maintenance. The concept of object oriented programming, constructor and destructor was not mention in the C language and hence C++ is introduced. It did not check run time. The C did not include strict checking and namespace concept.

The concept of C++ tells us the features, advantages and disadvantages as follows.

The data is encapsulated in this programming language. The C++ is inherited[5]. It supports the data hiding. It supports polymorphism. It is the advanced version of C. It takes less time to compile. It has low memory manipulation features. The defining of data type is very good. The important properties of C++ language are encapsulation, polymorphism and abstraction[10]. This language inherits the properties of objects, methods, instance, message passing and inheritance[1]. The existing code is easy to maintain and modify as new objects with small difference to previous one. There is no need to repeat the program. It is object oriented programming language. It is portable language i.e it can run on any system. It uses multi styled programming which deals with logic, structure and procedure of programs. It follows the three styles of Generic, Imperative and Object Oriented. It provides performance and memory efficiency[1]. C++ is compatible with C due to easy execution of program. It reuses the code. This C++ language also has disadvantages as:

The C++ language is not secure[6]. It is very complex to use in high level program. It is very difficult to debug and complex when used for web applications. It does not support garbage collection. This C++ is not secure as it has friend function, pointer and global variable[6]. The main objective of Java programming language is that it is simple, secure and portable[10]. The other name for Java os Java Buzzwords. It is simple to use. It is object oriented. It can run on any system i.e it is portable as well as platform independent. It is secured and robust. It is architecture neutral, interpreted and high performance language. It is multi-threaded, distributed and dynamic[6]. Java was introduced after C++ to have its use easy for the user such that it can be easily compiled, debug and learn by the user[10]. Java uses automatic memory allocation and garbage collection and hence Java is simpler than C++[10]. Java allows to reuse the code and hence it is object oriented. Java runs on any other system and hence it is also called as platform independent language[6].

It is distributed, Secure. We can easily restore the data through stack allocation system[6]. It performs multiple task simultaneously within the program and hence it is multi-threaded. It consume more memory and is significantly slower than C and C+ +[10]. The default look of java applications is very different from other applications[4].

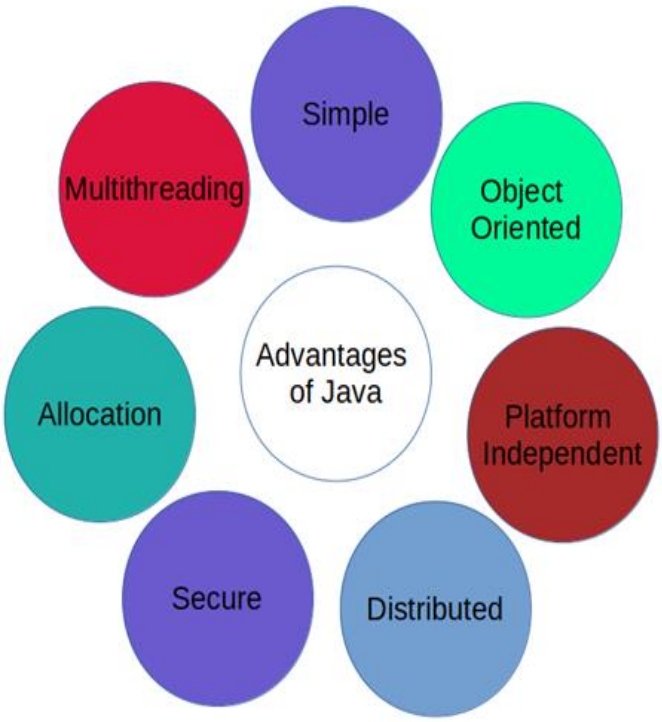

Fig 2

IV. FUTURE SCOPE

There are many languages introduced after C, C++ and Java such as Ruby, Python, PHP, Perl and many more. These new languages were introduced so to make the programming easier to compile and take less time to run. The languages are introduced to save the space in the memory and execution to be done faster. These languages made easy to use for the user. The C language is used in the ioT to develop the certain inventions which is making the world advanced in technology. It is also used in the gaming purpose such as archery, chess and many more in which multiple players can play and win the match.

The C++ language is used for gaming purpose. All the new types of online games are being designed by using C++ language which is not so complicated to use. The Java language is used where the portability exists. It was very difficult to solve the errors in software but these languages made it possible to solve the errors in easy and efficient way. The PUBG which is nowadays a trending game is made with the help of Java. The live online playing games are being programmed using Java.

V. CONCLUSION

These languages are best as well as worst in some cases. Java is better than C++ which is better than C. C++ is used for operating systems, games, embedded software, autonomous cars and medical technology, as well as many other applications.

REFERENCES

[1]. Stroustrup, B. An Overview of the C++ Programming Language The Handbook of Object Technology, CRC Press LLC, Boca Raton, 1999.
[2]. Ritchie, D. M. The Development of the C Language History of Programming Languages-IIed. Thomas J. Bergin, Jr. and Richard G. Gibson, Jr. ACM Press, New York, NY, and Addison-Wesley, Reading, MA,1996.
[3]. Kernighan, B.W. and Ritchie, D. M. The C Programming Language Prentice-Hall,1988.
[4]. Gosling, J., Joyn B., Steele, G., and Bracha, G. The Java Language Specification Third Edition Addison-Wesley, Reading, Ma, 2005.
[5]. Martin, R. C. Java and C++ A critical comparison. Cambridge Sigs Reference Library Series, 1998.
[6]. Let us C by Yashwant Kanetkar.
[7]. CProgramming in ANSI C written by E Balagurusamy.
[8]. E. Balagurusamy, Chairman, EBG Foundation, Coimbatore. McGraw Hill Education India Private Limited; Seventh edition (1 July 2017).
[9]. Robert C. Martin (January 1997). "Java vs. C++: A Critical Comparison".
[10]. A COMPARATIVE ANALYSIS OF THE C++, JAVA LANGUAGES Stephen J. Humer & Elvis C. Foster, 2014. Keene State College Project from course CS430 Principles of Programming Languages First Draft April 9, 2014.