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A comparative study of procedural language C and object oriented programming language C++

Abstract

Language is considered as a basic means of communication and human interaction for thousands of years. Language consists of words and sentences that people need to communicate and convey the meaning of same. Meanwhile in computer we find several numbers of hardware and software communicates with each other using 1's and 0's format. Earlier computer were actually programmed by changing ones and zeros manually by alternating circuit and its wiring. Later on development of programming languages was done as a revolutionary step in field of computer communication. Unlike normal languages keywords were set limited in programming language so developers started creating programs by combining the keywords and frame the code for particular program. Programming language is the set of instructions through which humans can interact with computers easily.

Keywords: *Procedural language, Object oriented language, programming language C, programming language C++, C, CPP*

INTRODUCTION

In any programming language, programmer writes source code text in programming language to create the programs. Here we are comparing two different programming languages, one is procedural language C and another is Object Oriented Programming language C++ which concludes with a result that Object Oriented Programming language can be used to develop programs which helps in maintaining security more than procedural programming language.

INTRODUCTION TO PROCEDURAL PROGRAMMING LANGUAGE C

To make any automatic system there is a need of application software. To develop any application one can know programming with any language. If anyone is unknown to programming then there is a need of basic programming. To start journey with basic programming, C language is a very good choice for anyone. C is a powerful programming language to develop logic in programming. In any computer one can easily work with C language because it is portable. C is language which is used to create list of instructions for a system to do some specific task. When you write C program, you have to run it through compiler of C to make that program in executable code. A written program is in a language which can be easily understand by the user while an executable code is used and understand by the machine. To execute a program and view output a programmer must have to access C compiler. For the application of microcomputer C language is broadly used [1]. To learn any programming language concepts of C language provides a basic foundation. Right now C language is available as a core subject in the curriculum. Students are facing difficulty to write programs in C at the starting level [2].

INTRODUCTION TO OBJECT ORIENTED PROGRAMMING LANGUAGE C++

C++ is a middle level programming language which also supports Object Oriented programming. It was an extension for C language. C++ is almost always considered and implemented as Compiled Language. C++ is more lightweight programming language. C++ is standardized by the International Organization for Standardization (ISO) in December 2017 as ISO/IEC 14882:2017. C++ inherits most of C language syntax and considers as superset of C. Supports manual memory management which means there is no automatically garbage collector in C++.

EQUIVALENCE BETWEEN C LANGUAGE AND C++ LANGUAGE

- One can feel same environment in both C and C++ language
- Syntax of both languages are almost same
- Blocks for code are same in both C and C++
- Process of compilation for a program is similar for C and C++ language
- Keywords, operators, conditional statements, loops, array etc. concepts are available in C and C++ both with the same logical process
- Both languages are known as middle level programming language.

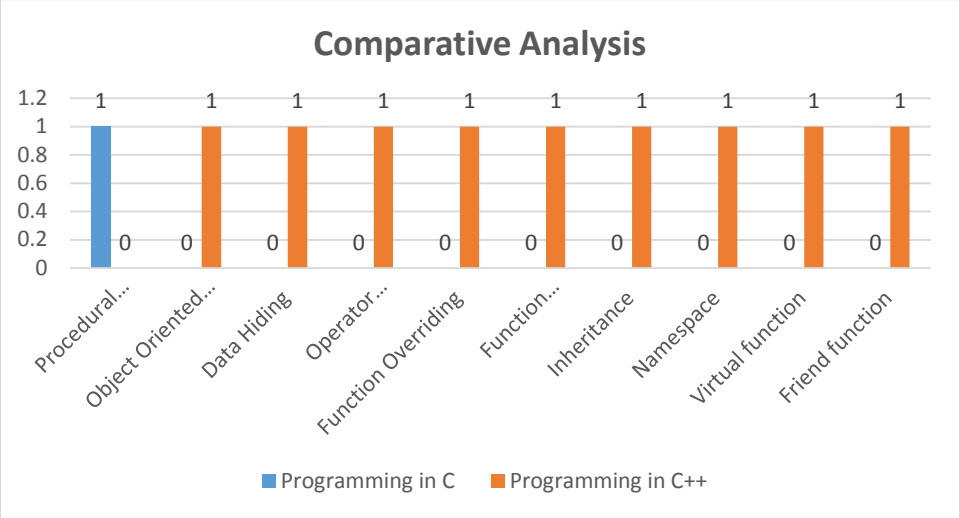
BASIC COMPARISON BETWEEN C AND C++

C programming language	C++ programming language
C programming language was developed by Dennis Ritchie in the year 1972 at AT&T Bell Labs.	C++ programming language was developed by Bjarne Stroustrup in 1979.
32 keywords are used to develop program in C language.	52 keywords are used to develop program in C++ language.
Standard input output functions are accessible from stdio.h header file in C language.	Standard input output functions are accessible from iostream.h header file in C++ language.
Extension of a C program file is .c	Extension of a C program file is .cpp
A multiline code of C programming language can be divided into small part which is known as functions.	A multiline code of C++ programming language can be divided into small part which is known as class.
Variable declaration is allowed only at the beginning of the C program.	Variable declaration is allowed anywhere in the same program in C++.
To allocate dynamic memory in C language one can use malloc() and calloc().	To allocate dynamic memory in C++ language one can use new operator.
Procedural programming language.	Object Oriented programming language.
C is a function driven language.	C++ is an object driven language
Approach of C programming language is Top Down.	Approach of C++ programming language is Bottom Up.
C is a subset of C++ language.	C++ is a superset of C language.

COMPARATIVE ANALYSIS OF C AND CPP

Sr. No.	Functionality	Programming in C	Programming in C++
1	Procedural programming	Yes	No
2	Object Oriented Programming	No	Yes
3	Data Hiding	No	Yes
4	Operator Overloading	No	Yes
5	Function Overriding	No	Yes
6	Function Overloading	No	Yes
7	Inheritance	No	Yes
8	Namespace	No	Yes
9	Virtual function	No	Yes
10	Friend function	No	Yes

GRAPHICAL REPRESENTATION OF COMPARATIVE ANALYSIS



CONCLUSION

Based on the above content of procedural language and object oriented language one can say that object oriented language is more secure than procedural language. Object oriented programming language has secure features like encapsulation, inheritance, abstraction etc. for data integrity. In short we can say that C programming language is a subset of C++ programming language or C++ programming language is a superset of C language.

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