EVALUATION OF STANDARD PROGRAMMING LANGUAGES

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ABSTRACT

"The purpose of learning a programming language is to become a better programmer i.e. to become more effective on designing and implementing new systems and on maintaining old ones." C, C++ and Java are the most popular standard programming languages used today at a broad level. They have a pretty similar syntax for basic concepts. Most of the basic control statements like if statements, loops, function syntax, switch case statements and concepts like recursion are still valid. Many other concepts like the syntax for comments, and the idea of static class variables, also hold in both Java and C++. Java uses the syntax of C and structure of C++ language. So lets study and evaluate all basic languages in this paper.

Keywords: *C, C++, Java, Programming codes and structure*.

1.Introduction

***A. C Language**:* It is a general-purpose high level language that was originally developed by Dennis Ritchie in 1972 for the UNIX operating system. C is a successor of B language which was introduced around 1970. C is a structured language which is easy to learn and produces efficient programs. it`s a top-down approach. It can handle low-level activities and can be compiled on a variety of computers. Today C is the most widely used System Programming Language.

Limitations:-

1 There is no run time checking and no strict type checking in C language
2 C doesn't have the concept of namespace, constructors and destructors, polymorphism, data hiding and the others
3 It does not provide data security and no help for solving real world problems
4 There is no enough library function for handling today's programming environment

Applications:-

1 C programming language can be used to design the system software like operating system and Compiler
2 It is used to develop application software like database and spread sheets.
3 For Develop Graphical related application like computer and mobile games.
4 To evaluate any kind of mathematical equation use c language.
5 UNIX Kernal is completely developed in C Language.
6 For creating compiler of different Languages which can take input from other language and convert it into

lower level machine dependent language.

7 C programming language can be used to design Operating System.

8 C programming language can be used to design Network Devices.

B. C++ Language: It is a general purpose programming language developed by Bjarne Stroustrup starting in 1979 at Bell Labs, designed to make programming more enjoyable

for the serious programmers. C++ is a superset of the C programming language.

In addition to the facilities provided by C, C++ provides flexible and efficient facilities for defining new types. The key concept in C++ is class. A class is a user defined type. C++ supports structures, unions, templates, operator overloading, pointers and pointer arithmetic operations.

Limitations:

1 Gets complex when u want to develop a graphics rich application in c++.

2 Does not provide efficient means for garbage collection

3 C++ code is easily prone to errors related to data types, their conversions, for example, while passing arguments to functions.
Portability of code on various platforms, etc

Applications:-

1 For Develop Graphical related application like computer and mobile games.
2 To evaluate any kind of mathematical equation use C++ language.
3 C++ Language are also used for design OS. Like window xp
4 Google also use C++ for Indexing
5 Few parts of apple OS X are written in C++ programming language
6 Internet browser Firefox are written in C++ programming language
7 All major applications of adobe systems are developed in C++ programming language. Like Photoshop, ImageReady, Illustrator and Adobe Premier
8 Some of the Google applications are also written in C++, including Google file system and Google Chromium.
9 C++ is used for design database like MySQL.

C. Java Language: - Java is a programming language created by James Gosling from Sun Microsystems in 1991. The first publicly available version of Java (Java 1.0) was released in 1995. The Old name of Java was Oak. Java is now taken by Oracle Corporation. The acquisition of Sun Microsystems by Oracle Corporation was completed by Oracle in January 2010.The current version of Java is Java 1.7 (Java 7). Java is a Programming language as well as a Platform itself. Java is an Interpreted language while C, C++ are compiled languages.

Limitations:-

1 No preconditions and postconditions
2 No separation of specification from implementation
3 No support for genericity
4 No enumeration types and No local constants
5 Exceptions not caught within a method must be declared as thrown by that method.

Applications:-

1 Mobile Applications and Scientific Applications
2 Embedded Systems:
3 Enterprise Applications:
4 for Desktop GUI

2.Description

A. Structure in C:

"C is a structural or procedural type of programming language. It's a top-down approach it means data should be executed from top to down sequence." C lays emphasis on the steps or procedures that are followed to solve a problem. C does not support function overloading. C does not provide String or Boolean data types. It supports primitive & built-in data types. C does not support functions with default arrangements. C does not have inline function. In C programming language, the data is unsecured.

C program basically consist of the following parts:-

Header file /preprocessor directives, Functions, Variables, Statements and expressions, Comments

Structure --

```
#include<stdio.h>          //header file or preprocessor directives
#include<conio.h>
        void main()                              // main function
{
        //variable or data type declaration
        //Statements or expressions
}
```

B. Structure in C++

C++ is object oriented programming language. It is bottom-up approach; it means that data should be executed from down to top sequence. C++ consists of various classes and a single main class that should be executes the data. Data is hidden in C++ and is not accessible to external functions. Hence, is more secure. C++ supports Exception handling exception handling can be done through try & catch block. C++ supports functions with default arrangements.

Structure --

```
#include<iostream.h>                    //header file
        int main()                              //main function
{
        //variables or data type declaration
        //statements and expressions
}
```

C. Structure in Java

Java is also a object oriented programming language. It doesn't contain any header file. All java programs create in classes. Java support automatic garbage collection. It does not support destructors as C++ does. Java does not support conditional compilation and inclusion.

Structure --

```
        class Demo                          //main class name//
{
        public static void main(String args[])          //main function or method//
 {
         //variables and data type declaration
        //statements and expressions
   } }
```

3. Comparative Analysis

Let us see features of C, C++ and Java with the help of table

No	Features	C	C++	Java
1	Year which Developed	1972	1979	1991
2	Developed By	Dennis Ritchie	Bjarne Stroustrup	James Gosling
3	Successor of	BCPL	C	C(Syntax) & C++ (Structure)
4	Paradigms	Procedural	Object Oriented	
5	Reserve / Keywords	32	63	50 defined (goto, constunusable)
6	Dependency in Platform	Dependent	Dependent	Independent
7	union, structure Data types	Supported	Supported	Not Supported
8	Pre-processor directives	Supported (#include, #define)		
9	Header files	Supported		Use Packages (import)
10	Inheritance	Not use	Supported	Only Multiple Inheritance not Supported
11	Overloading	Not supported	Supported	Only Operator Overloading not
12	Pointers	Supported		No Pointers used
13	Translation in code	Compiled		Interpreted
14	Storage Allocation	malloc, calloc are uses	new , delete are uses	garbage collector uses
15	Multi-threading and Interfaces	Not Supported		Supported
16	Exception Handling	No Exception handling	Supported	
17	Templates	Not Supported	Supported	Not Supported
18	auto, extern Storage class	Supported	Supported	Not Supported
19	Destructors	No Constructor or Destructor	Supported	Not Supported
20	Connectivity in databases	Not Supported		Supported

Table 1. Various features of languages

4. Conclusion

After study and compare of standard programming languages we have gained the basic information of languages. Where the procedural language can be used to design operating system and compiler designing as well as the object-oriented programming languages can be used for web designing, software designing and so . Also we learn about its applications and limitations of object oriented programming language which has reduced the complexity of software design.

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