Difference Between C and Objective C

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Key Difference - C vs Objective C

Programming languages are useful to create meaningful sets of instructions for the computer to perform a specific task. Two widely used programming languages are C and Objective C. Objective C is based on C language. Therefore, C programs can be compiled and run as Objective C. Objective C consist of fundamental C as well as object-oriented concepts, messaging, protocols etc. The **key difference** between C and Objective C is that **C is a structured programming language and Objective C is a multi-paradigm programming language which is a superset of C.** Objective C mostly supports reflective and object-oriented programming paradigms.

What is C?

C is a general-purpose programming language. Dennis Ritchie found C language when developing UNIX operating system. It is the foundation programming language for many languages including Java, Python, C# etc. It is a structured programming language. The programmer can use functions and iterations in coding. C does not support object-oriented programming.The source code written in C language is understood by humans and not understood by the computer. Therefore, the source code is converted into machine language using the compiler. One frequently used compiler is GNU C/C++ compiler. One should need a text editor and a compiler to run C programs or use an Integrated Development Environment(IDE).

In C, main() is where the execution begins. C has a number of data types for variables such as int, float, double, char etc. There are also arrays, structures, enums and unions. It is necessary to declare the variable data type in C. Undeclared variables cause errors. Constants can be defined using "const" keyword or #define preprocessor. C has four storage classes which explain the lifetime of a variable or function. They are auto, register, static and extern. The C standard library provides some built-in functions for programmers to use in their coding. For example, there are functions such as strlen, strcpy, and strcat for string manipulation. Other than that, the programmer can create user-defined functions too.

C use header files. They consist of function declarations and macro definitions. There are header files which come with the compiler, and there are files which are written by the programmer. Rather than copying and pasting the content of the header file, the programmer can include the header files. For example #include<stdio.h> the command indicates the compiler to include the header file "stdio.h".
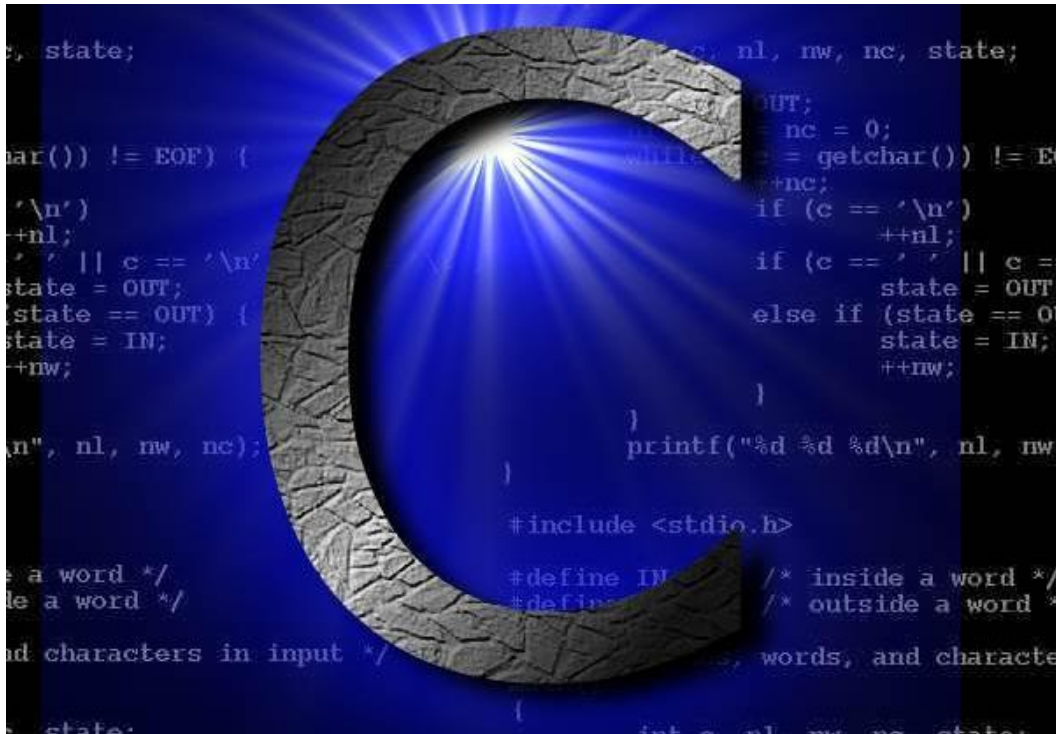
Figure 01: C Language

C has pointers. It is a fundamental concept to perform dynamic memory allocation. A pointer is a variable which stores the address of another variable. Unlike programming languages like C# or Java, C does not have an automatic garbage collector. Therefore, the programmer should do dynamic memory allocation on his own. Functions such as calloc(), malloc(), realloc() and free() are available in the <stdlib.h> header file for dynamic memory management. C is useful for developing algorithms and mostly for hardware-based application development. It is using for embedded systems, network drivers and operating systems and many more.

What is Objective C?

The C programming language was introduced around 1970. Around the 1980s, an object-oriented language Smalltalk was introduced. As C is a structured programming language, it was valuable to have an object-oriented version of C language. One method was to create a new language which is called C++. Another method was to get ideas from Smalltalk and roll them into C to make a new language. This new language known as Objective C. Objective C was developed by Apple and mainly using for IOS and Mac application development. Programming languages such as C#, Java are based on C, but they are independent languages. Objective C is C with features. It is a superset of C.

Objective C is a compiler based language. The complete source code is converted into machine code. Like in C, the programmer can use a text editor and a GCC compiler to run Objective C programs. The compiler converts the source code to the executable file.

Objective C has data types such as int, float, double, unions, pointers, structures and extended data types such as NSArryas and NSDictionaries.

Objective C has classes, objects, messaging, exceptions, properties, and protocols. The @ symbol is used to indicate the compiler about the new syntax. For example, C does not have a try, catch, but Objective C has to try and catch indicated using @ symbol. Other examples are @interface, @implementation, @property, @protocol.

What are the Similarities Between C and Objective C?

- Objective C is based on C.
- Both are compiler based languages.
- Both languages use header files.
- The statements in both languages end with a semicolon.
- The compiler ignores whitespaces. Whitespaces can improve code readability.
- Both are case-sensitive languages.
- Can define constants using the #define preprocessor and const keyword.
- Array index starts with zero.

What is the Difference Between C and Objective C?

C vs Objective C	
C is a general-purpose language which supports structured programming.	Objective C general purpose, multi-paradigm (reflective, object-oriented) programming language which is a superset of C language.
Object Orientation	
C does not support Object Oriented programming.	Objective C supports Object-oriented programming. Inheritance, Abstraction, Encapsulation and Polymorphism.
Data Types	
C has arrays, structures, enums.	Objective C has extended data types such as NSArray, NSDictionary, NSSet etc.
Features	
C language contains loops, functions, arrays, pointers etc.	Objective C is a superset of C. It has C concepts and new features such as classes, objects, messaging, exceptions and protocols.
Applications	

C is widely using for developing hardware-related applications such as operating systems and network drivers.	Objective C is mostly using for Mac and IOS application development.

Summary - C vs Objective C

C and Objective C are popular programming languages today. Objective C is a superset of C with object-orientation and additional features. The difference between C and Objective C is that C is a structured programming language and Objective C is a multi-paradigm programming language which is a superset of C. Both languages are general purpose programming languages, but they are used mainly for a specific type of applications. C is widely using for embedded systems, operating systems development and Objective C is mainly using for IOS and Mac application development.

Reference:

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How to Cite this Article?

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