Introduction to C

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C – Language History

- The C language is a structure oriented programming language, developed at Bell Lab (AT&T) in 1972 by Dennis Ritchie
- C language features were derived from an earlier language called "B" (Basic Combined Programming Language – BCPL)
- C language was invented for implementing UNIX operating system
- In 1978, Dennis Ritchie and Brian Kernighan published the first edition "The C Programming Language" and commonly known as K&R C
- In 1983, the American National Standards Institute (ANSI) established a committee to provide a modern, comprehensive definition of C. The resulting definition, the ANSI standard, or "ANSI C", was completed late 1988.

C language standards

- C89/C90 standard – First standardized specification for C language was developed by the American National Standards Institute in 1989. C89 and C90 standards refer to the same programming language.
- C99 standard – Next revision was published in 1999 that introduced new features like advanced data types and other changes.

Features of C language

- Reliability
- Portability
- Flexibility
- Modularity
- Efficiency and Effectiveness

Uses of C language

- The C language is used for developing system applications that forms a major portion of operating systems such as Windows, UNIX and Linux. Below are some examples of C being used.
  - Database systems
  - Graphics packages
  - Word processors
  - Spreadsheets
  - Operating system development
  - Compilers and Assemblers
  - Network drivers
  - Interpreters

C is Middle Level Language

- There are following reason that C is called Middle Level Language as:
  - C programming language behaves as high level language through function, it gives a modular programming and breakup, increased the efficiency for resolvability.
  - C programming language support the low level language i.e. Assembly Language.
  - C language also gives the facility to access memory through pointer.
  - Its combines the elements of high-level languages with the functionalism of assembly language.
- So, C language neither a High Level nor a Low level language but a **Middle Level Language**.

The C language is a structured language

S.no	Structure oriented	Object oriented	Non structure
1	In this type of language, large programs are divided into small programs called functions	In this type of language, programs are divided into objects	There is no specific structure for programming this language
2	Prime focus is on functions and procedures that operate on the data	Prime focus is in the data that is being operated and not on the functions or procedures	N/A
3	Data moves freely around the systems from one function to another	Data is hidden and cannot be accessed by external functions	N/A
4	Program structure follows "Top Down Approach"	Program structure follows "Bottom UP Approach"	N/A
5	Examples: C, Pascal, ALGOL and Modula-2	C++, JAVA and C# (C sharp)	BASIC, COBOL, FORTRAN

Key points to remember in C language

- The C language is structured, middle level programming language developed by Dennis Ritchie
- Operating system programs such as Windows, Unix, Linux are written in C language
- C89/C90 and C99 are two standardized editions of C language
- C has been written in assembly language

C language tutorial reference E-books & research papers

- [ANSI 89] American National Standards Institute, American National Standard for Information Systems Programming Language C, X3.159-1989.
- [Kernighan 78] B. W. Kernighan and D. M. Ritchie, The C Programming Language, Prentice-Hall: Englewood Cliffs, NJ, 1978. Second edition, 1988.
- [Thinking 90] C* Programming Guide, Thinking Machines Corp.: Cambridge Mass., 1990.