Overview

C is a general-purpose, imperative computer programming language that supports structured programming.

- Uses statements that change a program's state, focusses on how.

- Currently, it is one of the most widely used programming languages of all time.

- C is a modern language
  - has most basic control structures and features of modern languages.
  - designed for top-down planning
  - organized around the use of functions (modular design) structured programming
  - a very reliable and readable program.

- C is used on everything from minicomputers, Unix / Linux systems to pc's and mainframes.
- C is the preferred language for producing word processing programs, spreadsheets and compilers.
- C has become popular for programming embedded systems.
- used to program microprocessors found in automobiles, cameras, DVD players, etc.
- C has and continues to play a strong role in the development of Linux.
- C programs are easy to modify and easy to adapt to new models or languages.
- In the 1990s, many software houses began turning to the C++ language for large programming projects.
- C is a subset of C++ with object-oriented programming tools used, added
  - any C program is valid C++ program.
  - By learning C, you also learn much of C++.
- C remains the core skill needed by corporations and ranks in the top 10 of desired skills.

- C provides constructs that map efficiently to typical machine instructions and thus it is used by programs that were previously implement in assembly language.
  - provides low-level access to memory (has many low-level capabilities)
  - requires minimal run-time support.

- was invented in 1972 by Dennis Ritchie of Bell laboratories,
  - Ritchie was working on the design of the UNIX operating system.

- was created as a tool for working programmers
  - main goal is to be a useful language.
  - Easy readability and writeability

HISTORY

- C initially became widely known as the development language of the UNIX operating system.
  - virtually all new major operating systems are written in C and/or C++.

- C evolved from a previous programming language

named B

- uses many of the important concepts of B while adding data typing and other powerful features.
- B was a "typeless" language - every data item occupied one "word" in memory, and the burden of typing variables fell on the shoulders of the programmer.

- C is available for most computers
- C is also hardware independent.
- By the late 1970s, C had evolved into what is now referred to as "traditional C".
- The rapid expansion of C working on many different hardware platforms led to many variations that were similar but often incompatible.
  - a standard version of C was created (C89/C90, C99, C11)
- A program written only in standard C and without any hardware-dependent assumptions

will run correctly on any platform with a standard C compiler.

- Non-standard C programs may run only on a certain platform or with a particular compiler.
  (Standardization is important)

- C89 is supported by current C compilers
  - most C code being written today is based on it.

- C99 is a revised standard for the C programming language that refines and expands the capabilities of C.
  - has not been widely adopted and not all popular C compilers support it.

Standards

- The current standard is commonly referred to as C11.
  - some elements of the language as defined by C11 are optional.
  - also possible that a C11 compiler may not implement all of the language features mandated by the C11 standard.

- this class will base its examples and concepts of C11
- C is one of the most important and popular programming languages.
- It has grown because people try it and like it
- In the past decade or two, many have moved from C to languages such as C++, C#, and Java.
  - C is still an important language in its own right, as well as a migration path to these others.