Fortran (Formula Translator) Encyclopedia Article

Fortran (Formula Translator)

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FORTRAN is an acronym for FORmula TRANslator, the first high-level **programming** language. FORTRAN was developed by **John Backus** and colleagues at the **IBM** Corporation beginning in 1954. The first issue of FORTRAN was in 1957. FORTRAN version 66 was the first programming language to be standardized. This has made the language portable, since the program will run on any computer that has a FORTRAN **compiler**.

A high-level programming language is one that enables the programmer to write programs that are linked to a certain type of computer. These languages are closer to human language and further removed from **machine language**.

FORTRAN is a popular programming language for scientists and engineers, because of its faculty in handling numeric **data**. By 1977, other languages such as **Pascal**, Ada, **Modula**, **C**, and **C++** had begun to rival FORTRAN for this science and engineering niche. Then, the release of FORTRAN versions 77 and 90 improved the language's capabilities. The release of FORTRAN 2000 is expected during the year 2002.

A FORTRAN program generally consists of a main program, also called a river, and can include several subprograms, also called procedures or subroutines. A typical program is a sequence of lines of text, which follows a certain structure. As an example, the following is a program concerned with the derivation of the area of a circle:

- <tabprogram circle
- <tabreal r, area
- c This program reads a real number r and prints
- c the area of a circle with radius r
- <tabwrite (*,*) 'Give radius r:'
- <tabread (*,*) r
- <tabarea = 3.14159*r*r
- <tabwrite (*,*) 'Area=', area
- stop
- end

The lines that begin with a "c" are comments, which make the text more understandable to the user. Comments can appear anywhere in the program. Their inclusion is often helpful to the understanding of the program. All FORTRAN programs were originally written in upper case letters. Now, lower case is acceptable. Additionally, while the formatting of the **code** was strictly defined in FORTRAN version 77, a more free-form code is permissible in FORTRAN 90. The latter version also incorporates dynamic **memory** allocation.

The High-Performance FORTRAN (HPF) language is a relatively recent, data parallel extension to FORTRAN 90. Data-parallel means that information can be considered by

both user-defined functions and system functions. Once more widely implemented, HPF could be of great benefit to the scientific engineering analyses of data.