Fortran

Chapter 1 Introduction

1-1 Computer Languages

(1) 低階語言：語言的思考方式和電腦完全相同

機械語言

組合語言

(2) 高階語言：思維方式較進乎於人腦

FORTRAN, COBOL, BASIC, C, C++, PASCAL, LISP, JAVA

1-2 The History of Fortran Language

ForTran : Formula Translate

應用於理、工方面的計算

1953：開始發表.

1957：第一個 Fortran compiler 出廠.

1966：美國國家標準局制訂 Fortran 語言的官法標準 ~ Fortran 66.

1979：新的 Fortran 語言標準形成 ~ Fortran 77，較"結構化".

1991：~ Fortran 90，物件導向的觀念及工具，提供指標，加強陣列的功能.

1997：~ Fortran 95，minor update of Fortran 90.

2003：~ Fortran 2003，object-oriented and generic programming.

2010：~ Fortran 2008，was approved in September 2010. As with Fortran 95, this is a minor upgrade, incorporating clarifications and corrections to Fortran 2003, as well as introducing a select few new capabilities.

1-3 Properties of Fortran Language

Paradigm multi-paradigm: imperative (procedural), structured, object-oriented, generic

Stable release Fortran 2008 (ISO/IEC 1539-1:2010) (2010)

Typing discipline strong, static, manifest

Major implementations Absoft, Cray, GFortran, G95, IBM, Intel, Lahey/Fujitsu, Open Watcom, Pathscale, PGI, Silverfrost, Oracle, XL Fortran, Visual Fortran, others

Influenced by Speedcoding

Influenced ALGOL 58, BASIC, C, PL/I, PACT I, MUMPS, Ratfor

Usual file extensions .f, .for, .f90, .f95, .f03

1-4 G95

Free Fortran 95 compliant compiler.

Stable version 0.92, June 2009
http://www.g95.org/downloads.shtml#V0.92

g95 -o hello h1.f90 h2.f90 h3.f90
Compiles multiple source files and links them together to an executable file named hello on unix, or hello.exe on MS Windows systems.

Runtime Error Codes
Running a g95-compiled program with the --g95 option will dump this list of error codes to standard output.

-2 End of record
-1 End of file
0 Successful return
Operating system error codes (1 - 199)
200 Conflicting statement options
201 Bad statement option
202 Missing statement option
203 File already opened in another unit
204 Unattached unit
205 FORMAT error
206 Incorrect ACTION specified
207 Read past ENDFILE record
208 Bad value during read
209 Numeric overflow on read
210 Out of memory
211 Array already allocated
212 Deallocated a bad pointer
214 Corrupt record in unformatted sequential-access file
215 Reading more data than the record size (RECL)
216 Writing more data than the record size (RECL)