## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of techical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and nongovernmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication of an International Standard requires approval by at least 75% of the national bodies casting a vote.

International Standard ISO/IEC 1539-1 was prepared by Joint Technical Committee ISO/IEC/JTC1, *Information technology*, Subcommittee SC22, *Programming languages, their environments and system software interfaces*.

This fourth edition cancels and replaces the third edition (ISO/IEC 1539-1:1997), which has been technically revised.

ISO/IEC 1539 consists of the following parts, under the general title *Information technology — Programming languages — Fortran*:

— *Part 1: Base language*

— *Part 2: Varying length character string*s

— *Part 3: Conditional Compilation*

Annexes A to D of this part of ISO/IEC 1539 are for information only.

## Introduction

*Standard programming language Fortran*

This part of the international standard comprises the specification of the base Fortran language, informally known as Fortran 2000. With the limitations noted in 1.5.2, the syntax and semantics of Fortran 95 are contained entirely within Fortran 2000. Therefore, any standard-conforming Fortran 95 program not affected by such limitations is a standard conforming Fortran 2000 program. New features of Fortran 2000 can be compatibly incorporated into such Fortran 95 programs, with any exceptions indicated in the text of this part of the standard.

Fortran 2000 contains several extensions to Fortran 95; among them are:

(1) Derived type enhancements (parameterized derived types, mixed component accessibility, public entities of private types, ASSOCIATE construct, generalized constructors, and finalizers);

(2) Object-oriented programming (extensible types, inheritance, polymorphism, dynamic type allocation, and type-bound procedures);

(3) Data manipulation enhancements (allocatable components, deferred type parameters, VOLATILE attribute, explicit type specification in array constructors, INTENT specification for pointer arguments, specifying pointer lower bounds in pointer assignments, extended initialization expressions, MIN and MAX intrinsic functions for character type, and enhanced complex constants);

(4) Input/output enhancements (asynchronous input/output, stream input/output, user-defined derived-type input/output, control of rounding during format conversion, named scratch files, and named constants for standard-defined units and status values);

(5) Procedure pointers and abstract interfaces;

(6) Scoping enhancements (renaming of defined operators and control of host association into interface bodies);

(7) Support for exceptions and IEEE arithmetic;

(8) Interoperability with the C programming language;

(9) Support for cultural adaptability; and

(10) Miscellaneous enhancements (command line arguments, environment variables, increased statement length, and access to error message text.)

## Organization of this part of ISO/IEC 1539

This part of ISO/IEC 1539 is organized in 16 sections, dealing with 8 conceptual areas. These 8 areas, and the sections in which they are treated, are:

| | |
|---|---|
| High/low level concepts | Sections 1, 2, 3 |
| Data concepts | Sections 4, 5, 6 |
| Computations | Sections 7, 13, 14 |
| Execution control | Section 8 |
| Input/output | Sections 9, 10 |
| Program units | Sections 11, 12 |
| Interoperability with C | Section 15 |
| Scoping and association rules | Section 16 |

It also contains the following nonnormative material:

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|---|---|
| Glossary | Annex A |
| Decremental features | Annex B |
| Extended notes | Annex C |
| Index | Annex D |