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Information technology — Programming languages, their environments and system software interfaces — Programming language Extended APL

Technologies de l'information — Langages de programmation, leurs environnements et interfaces logiciel système — Langage de programmation APL étendu

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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 technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 13751 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 22, *Programming languages, their environments and system software interfaces*.

Annex A forms a normative part of this International Standard.

Introduction

APL stands for **A Programming Language**. It is a notation invented by K. E. Iverson in the late 1950s for the description of algorithms, and expanded on and made into the programming system *APL\360* by Iverson and his colleagues Adin Falkoff, Larry Breed, Dick Lathwell, and Roger Moore in the mid-1960s.

This document, **Programming Language APL, Extended**, is a sequel to **Programming Language APL**, ISO 8485 (1989).

The principal differences that the reader will find here have to do with new features that have been added. These topics are:

without
greatest common divisor
least common multiple
duplicate
commute
table
join along first axis
mixed arrays
overbar in names
underbar in names
replicate
character grades
grades of arrays greater than rank one
unique
alpha as a name
omega as a name
ambivalent defined functions
event handling
n-wise reduction
complex arithmetic
left
right
function rank operator
defined operators
component file system

enclose
disclose
enlist
pick
depth
identical
each
first

An entry for each of these topics will be found in the index. Some new system commands have been added. Shared variable extensions have been added. Workspace Interchange Standard 2 is given, in which canonical representation vectors of type “E” are used to represent generalised arrays.

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1 Scope

This International Standard defines the programming language APL and the environment in which APL programs are executed. Its purpose is to facilitate interchange and promote portability of APL programs and programming skills. This International Standard specifies the syntax and semantics of APL programs and the characteristics of the environment in which APL programs are executed.

It also specifies requirements for conformance to this International Standard, including the publication of values and characteristics of implementation properties so that conforming implementations can be meaningfully compared.

This International Standard does not specify:

– implementation properties that are likely to vary with the particular equipment or operating system used;

– required values for implementation limits such as APL workspace size or numeric precision;

– the data structures used to represent APL objects;

– the facilities available through shared variables.

2 Normative References

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO/IEC 2382-15:1999, *Information technology – Vocabulary – Part 15: Programming languages.*

ISO 8485:1989, *Programming languages – APL.*

International Register of Coded Character Sets To Be Used With Escape Sequences, Registered character set 68. (http://www.itscj.ipsj.or.jp/ISO-IR/068.pdf)

