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Programming languages — Prolog —

Part 3: Definite clause grammar rules as an extension of ISO/IEC 13211-1

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Foreword

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A list of all parts in the ISO/IEC 13211 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

Introduction

Definite clause grammar rules provide convenient functionality for parsing and processing text and structured lists in Prolog. They have been implemented in many Prolog processors.

This document extends ISO/IEC 13211–1. For convenience, it has been numbered to refer to relevant subclauses of the base standard. In particular, this document adds new subclauses to, and extends existing subclauses of ISO/IEC 13211–1.

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Programming languages — Prolog —

Part 3:

Definite clause grammar rules as an extension of ISO/IEC 13211-1

1 Scope

This document promotes the applicability and portability of Prolog grammar rules in data processing systems that support standard Prolog as defined in ISO/IEC 13211–1:1995/Cor 1:2007/Cor 2:2012/Cor 3:2017 and ISO/IEC 13211–2:2000. This document specifies:

- a) The representation, syntax, and constraints of Prolog grammar rules
- b) A logical expansion of grammar rules into Prolog clauses
- c) A set of built-in predicates for parsing with grammar rules

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 13211–1:1995, *Information technology — Programming languages — Prolog — Part 1: General core*.

ISO/IEC 13211–2:2000, *Information technology — Programming languages — Prolog — Part 2: Modules*.

ISO/IEC 13211–1:1995/Cor.1:2006, *Information technology — Programming languages — Prolog — Part 1: General core — Technical Corrigendum 1*

ISO/IEC 13211–1:1995/Cor.2:2012, *Information technology — Programming languages — Prolog — Part 1: General core — Technical Corrigendum 2*

ISO/IEC 13211–1:1995/Cor.3:2017, *Information technology — Programming languages — Prolog — Part 1: General core — Technical Corrigendum 3*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 13211-1:1995 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at www.iso.org/obp

— IEC Electropedia: available at www.electropedia.org

3.3 Grammar terms

3.3.1

alternative

compound term with principal functor (;)/2 or with principal functor (' | ')/2 with each argument being a grammar rule body

3.3.2

clause-term

read-term in Prolog text which has neither principal functor (: -)/1 nor principal functor (- ->)/2

Note 1 to entry: This term has been adapted from ISO/IEC 13211-1:1995, 3.33.

3.3.3

covered

being such a terminal sequence that the grammar rule body generates or parses the terminal sequence

3.3.4

definite clause grammar

set of non-terminal definitions

3.3.5

expansion of a grammar rule

preparation for execution of a grammar rule

Note 1 to entry: See ISO/IEC 13211-1:1995, 7.5.1 for more information on preparation for execution.

3.3.6

generating (w.r.t. a non-terminal and a definite clause grammar)

producing a terminal sequence of that definite clause grammar, obeying semicontexts, if any

3.3.7

grammar body cut

the atom !

3.3.8

grammar body element

grammar body cut, or a grammar goal, or a non-terminal, or a terminal sequence

3.3.9

grammar body not

compound term with principal functor ($\backslash +$)/1 whose argument is a grammar rule body

3.3.10

grammar body sequence

compound term with principal functor ($' , '$)/2 and each argument a grammar rule body

3.3.11

grammar goal

compound term with principal functor $\{ \}$ /1 whose argument is a goal

3.3.12

grammar rule

compound term with principal functor ($- \rightarrow$)/2

3.3.13

grammar rule body

compound term which forms, or is in the form of, the second argument of a grammar rule being a grammar body sequence, or an alternative, or a grammar body not, or a grammar body element, or a grammar goal

3.3.14

grammar rule head

first argument of a grammar rule ; either a non-terminal, or a compound term whose principal functor is ($' , '$)/2, with first argument a non-terminal, and second argument a semicontext

3.3.15

new variable with respect to a term T

variable that is not a member of the variable set of T

3.3.16

non-terminal

callable term, i.e., an atom or a compound term

Note 1 to entry: See ISO/IEC 13211-1:1995, 3.25 for a definition of "callable term".

3.3.17

non-terminal definition

sequence of grammar rules belonging to the same non-terminal

3.3.18

non-terminal indicator

compound term $A//N$ with A an atom and N a non-negative integer, denoting a non-terminal

3.3.19

parsing (w.r.t. a definite clause grammar)

successively accepting or consuming terminal sequences, assigning them to corresponding non-terminals and obeying semicontexts, if any

3.3.20

semicontext

terminal sequence occurring optionally after the non-terminal of a grammar rule head

3.3.21**steadfastness of a goal w.r.t. its N-th argument**

property that a goal G is equivalent to a goal $(G_v, V = T)$ where G_v is identical to G except for the N -th argument being a term T which has been replaced by a new variable V

3.3.22**terminal**

any Prolog term denoting a terminal symbol of the grammar

3.3.23**terminal sequence**

list which is either the empty list or a non-empty list whose first argument is a terminal, and the second argument is a terminal sequence

Note 1 to entry: See ISO/IEC 13211-1:1995, 3.99, 6.3.5 and 6.3.1.3 for a definition of "list".

3.3.24**terminal sequence, comprehensive**

terminal sequence containing a prefix, and the prefix covered by a grammar rule body, i.e. accepted or generated by phrase/3

3.3.25**terminal sequence, remaining**

rest of a comprehensive terminal sequence without the leading terminal sequence being covered by a grammar rule body

4 Symbols and abbreviations

None.

5 Conformance — (ISO/IEC 13211-1:1995: 5 Compliance)

5.1 Prolog processor

In addition to the specifications of ISO/IEC 13211-1:1995, 5.1, list items a), b), and c), the requirements of this document also apply. Moreover, after preparing Prolog text for execution, executing Prolog goals and rejecting any non-conforming Prolog text, the user shall specify all permitted variations of this document and ISO/IEC 13211-1:1995.

5.5 Extensions

5.5.13 Grammar control constructs and built-in non-terminals

A processor may support additional grammar control constructs (7.14) and built-in non-terminals as an implementation specific feature. Additional control constructs shall be treated as non-terminals when executed in strictly conforming mode (5.1e).

EXAMPLE Additional grammar control constructs include higher-order phrase//2 and phrase//3.