SLOVENSKI STANDARD
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Upravljanje z jezikovnimi viri - Lingua franca za korpusne poizvedbe (CQLF) - 1. del: Metamodel

Language resource management -- Corpus query lingua franca (CQLF) -- Part 1: Metamodel

Gestion des ressources linguistiques -- Corpus query lingua franca (CQLF) -- Partie 1: Métamodèle

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Language resource management — Corpus query lingua franca (CQLF) —

Part 1: Metamodel

Gestion des ressources linguistiques — Corpus query lingua franca (CQLF) —

Partie 1: Métamodèle

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Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 37, *Language and terminology*, Subcommittee SC 4, *Language resource management*.

A list of all parts in the ISO 24623 series can be found on the ISO website. Additional parts on single-stream and multi-stream ontology architectures are planned to be developed in the future.

Introduction

A range of standards relating to language resource management, with the Linguistic Annotation Framework (ISO 24612) at the centre, have been developed. These standards are mostly designed to regulate the representation aspect of language data – they look at the data from the point of view of preparation and curation. This document complements this perspective by that of the end-user, that is to say, from the point of view of processing and querying.

The corpus linguistic community has, by now, developed several corpus query languages (QLs), and there is a particularly large number of them if "dialects" and forks are included. There are two main reasons for this abundance. Firstly, there are socio-economic and organizational factors, with separate query systems having been created by isolated projects with un-coordinated funding, many of them eventually developing their own set of followers. Secondly, query systems are typically sensitive to the format of the data and are often designed with a specific purpose in mind. For example, systems for querying parallel audio and transcription streams with multiple speakers have different characteristics from systems designed to query purely textual data with a single layer of morphosyntactic description. Dependency and hierarchical annotations demand yet another set of solutions. All of this results in the richness of alternatives or near-alternatives on the one hand, and in the lack of interoperability among the variants on the other. As a consequence, a "wrong" choice at the beginning of a project can bury months of research by exposing inadequacies in the initial decision after the project has become mature enough to move to new extended functionality and towards addressing more complex information needs.

This document codifies, in a modular way, the best existing practices followed in the design of corpus query languages. Its theoretical aim is to provide a basis for the investigation of the relationships between language resource architecture and corpus query language properties. The practical aim of the Corpus Query *Lingua Franca* (henceforth CQLF) is to provide linguists and language technology practitioners with a clear and coherent basis for making informed choices concerning data architectures and the query languages appropriate to them.

Language resource management — Corpus query lingua franca (CQLF) —

Part 1: **Metamodel**

1 Scope

This document describes the abstract metamodel designed to accommodate any corpus query language (QL) and providing a basis for coarse-grained classification. The metamodel consists of several components referred to as CQLF classes, levels, and modules, and is illustrated with examples from the Single-stream class (where a single data stream is used to organize the relevant data structures). Within this class, this document discusses three CQLF levels (Linear, Complex and Concurrent), as well as their subdivisions into modules, dictated by functional and modelling criteria.

This document does not provide a way to specify further details beyond the above-mentioned divisions, and neither does it contain within its scope QLs designed to query more than one concurrent data stream, as in multimodal corpora or in parallel corpora (such QLs can still be classified according to the criteria suggested here for less expressive QLs).

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 24611, *Language resource management — Morpho-syntactic annotation framework (MAF)*

ISO 24612, *Language resource management — Linguistic annotation framework (LAF)*

ISO 24615-1, *Language resource management — Syntactic annotation framework (SynAF) — Part 1: Syntactic model*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

— IEC Electropedia: available at https://www.electropedia.org/

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

3.1
annotation
information added to *primary data* (3.9), independent of its representation

[SOURCE: ISO 24612:2012, 2.3, modified — "linguistic" at the beginning of the definition was deleted.]

3.1.1
concurrent annotations
multiple, potentially conflicting *annotations* (3.1) describing, entirely or partly, the same *character span* (3.2) or an overlapping sequence of character spans

Note 1 to entry: Concurrent annotations may be expected to conflict in several ways: content-wise (with different tags for the same character span), structure-wise (assuming different structural arrangements within the targeted character spans), and also in terms of segment edges (which is typically due to structurally conflicting claims concerning the encompassing character spans). Concurrent annotations typically come from different sources (e.g. tools or human annotators) or result from different settings (e.g. different parsing models or segmentation rules) within a single tool. When encoded in XML, concurrent annotations are typically expressed by means of stand-off techniques.

3.1.2
dependency annotation
annotation (3.1) that encodes the dependency relations between *character spans* (3.2)

Note 1 to entry: An example of a dependency relation (see ISO 24615-1:2014, 3.5) is one between a verb and its subject or direct object, between an attributive adjective and its head noun, or between a preposition and the head of its dependent noun phrase. Dependency relations may be defined at the word-level alone, or may involve higher-level syntactic constructs, in which case it is possible to speak of mixed hierarchical-dependency annotations.

3.1.3
hierarchical annotation
annotation (3.1) that encodes the relationship of dominance (often also precedence) necessary to define syntactic trees over *character spans* (3.2)

Note 1 to entry: Annotating hierarchical relationships requires only the relation of dominance to be indicated. Precedence is typically implicit in the ordering of character spans.

3.1.4
segmentation annotation
annotation (3.1) that delimits linguistic elements that appear in the *primary data* (3.9)

Note 1 to entry: These elements include (1) continuous segments (appearing contiguously in the primary data), (2) super- and sub-segments, where groups of segments will comprise the parts of a larger segment (e.g. contiguous word segments typically comprise a sentence segment), (3) discontinuous segments (linking continuous segments) and (4) landmarks (e.g. time stamps) that note a point in the primary data. In current practice, segmental information may or may not appear in the document containing the primary data itself.

[SOURCE: ISO 24612:2012, 2.5]

3.1.5
simple annotation
annotation (3.1) that constitutes a single information package whose interpretation is not dependent on other annotations

Note 1 to entry: This definition is intended to distinguish the simplest ("tabular") kind of annotation from more complex relational structures (providing hierarchical, dependency, or alignment information); simple annotations are the only kind of annotations present at the linear level of complexity.

3.1.6
stand-off annotation
annotation (3.1) that can be layered over *primary data* (3.9) but is separated from the data stream that it targets

Note 1 to entry: Stand-off annotations refer to specific locations in the primary data, by addressing the character offsets, elements or coordinates to which the annotation applies. They can be serialized as separate documents, but do not have to be. Multiple stand-off annotation documents for a given type of annotation can refer to the same primary document (e.g. two different part of speech annotations for a given text). It is also possible to construct hierarchies of stand-off annotation layers, where layer *n* can reference layers 0..*n*–1.

[SOURCE: ISO 24612:2012, 2.7, modified — The definition and note were modified.]

3.2
character span
sequence of characters, identified by start and end offsets, to which an annotation may be applied

Note 1 to entry: This definition is a relaxed version of the definition in ISO 24615-1:2014, 3.16, the difference lying in the use of "may be applied" over "is applied". Compare also the definition of "region" in ISO 24612:2012, 2.10.

3.3
character span containment
relation obtaining between *character spans* (3.2) of *primary data* (3.9) in which character span A contains character span B if the initial offset of span A is equal to or higher than that of span B, and the final offset of span A is smaller than or equal to that of span B

Note 1 to entry: The relation of character span containment is used for stating a relationship between two or more character spans or simple annotations, without the need to utilize tree-based concepts and mechanisms. Instead of tree traversal, operators such as *contains*, *in* or *within* are typically used for character span containment queries.

3.4
corpus query language
formal language designed to retrieve specific information from (large) language data collections, and thereby incorporate certain abstractions over commonly shared data models that make it possible for the user (or user agents) to address parts of those data models

3.5
CQLF class
top-level division in the CQLF data model

Note 1 to entry: The CQLF Metamodel distinguishes two classes: Single-stream (where the annotation structure is built upon a single data stream, typically a character stream) and Multi-stream (corresponding to e.g. multi-modal corpora or parallel corpora).

3.6
CQLF implementation
query language that has been analysed with respect to the criteria described by the CQLF Metamodel, and thus has been "located" in the proposed feature matrix as "conformant with CQLF"

3.7
CQLF level
part of the matrix of QL properties, defined in terms of the general features of the assumed corpus data models, and consequently the set of properties of a corpus query language that is used to address these features

Note 1 to entry: The CQLF Metamodel distinguishes three levels of complexity within the Single-stream class: Linear, Complex and Concurrent.

3.8
CQLF module
subcomponent of a CQLF level, defined with reference to a specified data-model characteristic

Note 1 to entry: CQLF Metamodel currently distinguishes three modules within CQLF Level 1, Linear (plain-text, segmentation, and simple annotation), and three modules within CQLF Level 2, Complex (hierarchical, dependency, and containment).

3.9
primary data
electronic representation of language data