INTERNATIONAL STANDARD

ISO/IEC 19075-1

First edition
2021-08

Information technology — Guidance for the use of database language SQL —

Part 1: XQuery regular expressions

Technologies de l'information — Recommandations pour l'utilisation du langage de base de données SQL —

Partie 1: Expressions régulières de XQuery en SQL

Reference number
ISO/IEC 19075-1:2021(E)

© ISO/IEC 2021



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword . . . v
Introduction . . . vii
1 Scope . . . 1
2 Normative references . . . 2
3 Terms and definitions . . . 3
4 XQuery regular expressions . . . 4
4.1 Context of XQuery regular expressions . . . 4
4.2 Introduction to XQuery regular expressions . . . 4
4.3 Matching a specific character . . . 4
4.4 Metacharacters and escape sequences . . . 5
4.5 Dot . . . 6
4.6 Anchors . . . 7
4.7 Line terminators . . . 7
4.8 Bracket expressions . . . 8
4.8.1 Introduction to bracket expressions . . . 8
4.8.2 Listing characters . . . 8
4.8.3 Matching a range . . . 9
4.8.4 Negation . . . 9
4.8.5 Character class subtraction . . . 9
4.9 Alternation . . . 9
4.10 Quantifiers . . . 10
4.11 Locating a match . . . 11
4.12 Capture and back-reference . . . 12
4.13 Precedence . . . 13
4.14 Modes . . . 13
5 Operators using regular expressions . . . 15
5.1 Introduction to operators using regular expressions . . . 15
5.2 LIKE_REGEX . . . 15
5.3 OCCURRENCES_REGEX . . . 16
5.4 POSITION_REGEX . . . 17
5.5 SUBSTRING_REGEX . . . 19
5.6 TRANSLATE_REGEX . . . 20
Bibliography . . . 23
Index . . . 24

© ISO/IEC 2021 – All rights reserved

Tables

Table

Page

1 Match priorities. 11

© ISO/IEC 2021 – All rights reserved

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.

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 document 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 or www.iec.ch/members_experts/refdocs).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents) or the IEC list of patent declarations received (see patents.iec.ch).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of 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 www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.

This first edition of ISO/IEC 19075-1 cancels and replaces ISO/IEC TR 19075-1:2011.

This document is intended to be used in conjunction with the following editions of the parts of the ISO/IEC 9075 series:

— ISO/IEC 9075-1, sixth edition or later;

— ISO/IEC 9075-2, sixth edition or later;

— ISO/IEC 9075-3, sixth edition or later;

— ISO/IEC 9075-4, seventh edition or later;

— ISO/IEC 9075-9, fifth edition or later;

— ISO/IEC 9075-10, fifth edition or later;

— ISO/IEC 9075-11, fifth edition or later;

— ISO/IEC 9075-13, fifth edition or later;

© ISO/IEC 2021 – All rights reserved

— ISO/IEC 9075-14, sixth edition or later;

— ISO/IEC 9075-15, second edition or later;

— ISO/IEC 9075-16, first edition or later.

A list of all parts in the ISO/IEC 19075 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.

© ISO 2021 – All rights reserved

Introduction

The organization of this document is as follows:

1) Clause 1, “Scope”, specifies the scope of this document.

2) Clause 2, “Normative references”, identifies additional standards that, through reference in this document, constitute provisions of this document.

3) Clause 3, “Terms and definitions”, defines the terms and definitions used in this document.

4) Clause 4, “XQuery regular expressions”, explains how XQuery regular expressions are formed.

5) Clause 5, “Operators using regular expressions”, explains how the SQL operators use regular expressions.

© ISO/IEC 2021 – All rights reserved

Information technology — Guidance for the use of database language SQL —

Part 1:
XQuery regular expressions

1 Scope

This document describes the regular expression support in SQL (ISO/IEC 9075-2) adopted from the regular expression syntax of XQuery and XPath Functions and Operators 3.1, which is derived from Perl. This document discusses five operators using this regular expression syntax:

— LIKE_REGEX predicate, to determine the existence of a match to a regular expression.

— OCCURRENCES_REGEX numeric function, to determine the number of matches to a regular expression.

— POSITION_REGEX function, to determine the position of a match.

— SUBSTRING_REGEX function, to extract a substring matching a regular expression.

— TRANSLATE_REGEX function, to perform replacements using a regular expression.

© ISO/IEC 2021 – All rights reserved

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 9075-1, *Information technology — Database languages — SQL — Part 1: Framework (SQL/Framework)*

ISO/IEC 9075-2, *Information technology — Database languages — SQL — Part 2: Foundation (SQL/Foundation)*

ISO/IEC 9075-14, *Information technology — Database languages — SQL — Part 14: XML-Related Specifications (SQL/XML)*

Bray, Tim et al.. *Extensible Markup Language (XML) Version 1.0, W3C Recommendation* [online]. Fifth Edition. Cambridge, Massachusetts, USA: W3C, 26 November 2008 . Available at `http://www.w3.org/TR/xml`

Bray, Tim et al. *Extensible Markup Language (XML) Version 1.1, W3C Recommendation* [online]. Second Edition. Cambridge, Massachusetts, USA: W3C, 16 August 2006 . Available at `http://www.w3.org/TR/xml11`

Biron, Paul V.; Malhotra, Ashok. *XML Schema Part 2: Datatypes, W3C Recommendation* [online]. Second Edition. Cambridge, Massachusetts, USA: W3C, 28 October 2004 . Available at `http://www.w3.org/TR/xmlschema-2/`

Malhotra, Ashok et al.. *XQuery and XPath Functions and Operators 3,1, W3C Recommendation* [online]. Cambridge, Massachusetts, USA: W3C, 21 March 2017 . Available at `http://www.w3.org/TR/-xpath-functions/`

The Unicode Consortium. *Unicode Regular Expressions* [online]. 21. Mountain View, California, USA: The Unicode Consortium, 2020-06-17 . Available at `http://www.unicode.org/reports/tr18/-tr18-21.html`

© ISO/IEC 2021 – All rights reserved

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 9075-1 apply.

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

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

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

© ISO/IEC 2021 – All rights reserved