ICTPRG425 Use structured query language

Release: 1

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Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to use a structured query language (SQL) to define, create, and manipulate database structures, and the associated data in a relational database.

It applies to individuals in a wide variety of information and communications technology (ICT) roles, where relational databases and SQL are being used.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Programming and software development

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Write a simple SQL statement to retrieve and sort data	1.1 Retrieve all the data from a single table 1.2 Retrieve data from specific columns in a single table 1.3 Use 'order by' to sort query output
2. Write an SQL statement that selectively retrieves data	2.1 Restrict the number of rows retrieved, by placing criteria in the 'where' clause 2.2 Restrict the number of rows retrieved, by placing specific criteria in the select statement 2.3 Use comparison operators in the 'where' clause to compare numeric, character, string, date and time data

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ELEMENT	PERFORMANCE CRITERIA
	2.4 Use Boolean operators with the correct precedence
	2.5 Use criteria in the 'where' clause, to check for a range of values, to select values from a list, and to check for values that match a pattern
	2.6 Use SQL syntax to suppress duplicate values from query results
	2.7 Take action to exclude null values from a query result
3. Write SQL statements that use functions	3.1 Use arithmetical operators with the correct precedence
	3.2 Use string functions, and operators, to obtain the required query output
	3.3 Use mathematical functions to obtain the required output
	3.4 Use date functions to obtain the required output
	3.5 Use SQL aggregate functions to obtain the required output
4. Write SQL statements that use aggregation and filtering	4.1 Use 'group by' to aggregate data by multiple columns
	4.2 Sort aggregated data in the query output
	4.3 Filter aggregated data using the 'having' clause
5. Write SQL statements that retrieve data from multiple tables	5.1 Employ the inner join syntax, to retrieve data from two or more tables
	5.2 Use 'left outer', 'right outer' and 'full outer' syntax, to join tables in the select statement
	5.3 Use correct syntax in the 'where' clause, to retrieve data from multiple tables
	5.4 Write a union query that retrieves data from more than one table
6. Write and execute SQL sub-queries	6.1 Construct single and nested sub-queries
	6.2 Construct sub-queries that return a single row and multiple rows
	6.3 Use correlated sub-queries to retrieve required data
	6.4 Write sub-queries that use aggregates
7. Create and manipulate tables	7.1 Identify the required columns, data types, keys, relationships, indexes and constraints
	7.2 Use the relevant naming conventions for database elements
	7.3 Create tables that implement the required elements

ELEMENT	PERFORMANCE CRITERIA
	7.4 Manipulate tables to meet specific requirements
8. Create and use views	8.1 Create views that satisfy information requirements
	8.2 Use check constraints in a view
	8.3 Retrieve, insert, update, and delete data using a view
	8.4 Drop a view from a database
9. Create and use stored procedures	9.1 Create and execute stored procedures that use SQL to retrieve, insert, or modify data, according to information requirements
	9.2 Create and execute stored procedures, that use one or more parameters
	9.3 Drop a stored procedure from the database
	9.4 Create and test database triggers that automate data management, or perform specific required data-related functions

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 7.1	• Interprets and critically analyses complex texts • Applies the appropriate strategies to construct meaning from complex texts
Writing	2.3-2.7, 3.1-3.5, 4.1, 5.1-5.4, 6.1-6.4, 7.3, 7.4, 8.1, 8.3, 9.1, 9.2, 9.4	• Prepares documentation that expresses ideas, explores complex issues, and is constructed logically, succinctly and accurately • Writes and edits, computer code and technical data, ensuring the correct syntax and accuracy
Numeracy	3.1, 3.3	• Selects from, and flexibly applies, a wide range of highly developed mathematical and problem-solving strategies and techniques in an SQL context • Uses a wide range of mainly formal, written mathematical language and representation, to communicate mathematically in an SQL context
Get the work done	All	• Sequences and schedules complex activities and monitors implementation, when analysing and organising data, according to requirements

		• Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information, and identifying, and evaluating options against the agreed criteria, when evaluating business requirements in relation to the database design • Uses analytical processes to decide on a course of action, establishing the criteria for deciding between options, when problem-solving in relation to typical warnings and syntax errors • Uses formal and informal processes to monitor implementation of solutions and reflect on outcomes when creating tables, views, and stored procedures • Uses a systematic process to identify possible solutions to a difficult problem when writing SQL statements and sub-queries • Understands the key principles and concepts underpinning the design, and operation, of digital systems and tools, and applies these in relation to using SQL in a relational database

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTPRG425 Use structured query language	ICAPRG425A Use structured query language	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2