Course Glossary: Introduction to Relational Databases (RDBMS)

Welcome! This alphabetized glossary contains many of the terms you'll find within this course. This comprehensive glossary also includes additional industry-recognized terms not used in course videos. These terms are important for you to recognize when working in the industry, participating in user groups, and participating in other certificate programs.

Term	Definition	Video/Reading where the term is introduced
3-Tier	Database on a remote server, accessed by client applications through a middle tier (application server) for added separation and security.	Video: Database Architecture
Adding a column	ALTER TABLE author ADD COLUMN telephone_number BIGINT;	Video: ALTER, DROP, and Truncate Tables
Administrative API	A programmatic interface for managing database objects, including table creation.	Video: Creating Tables
Alias	An alternative name is assigned to a database object for convenience or readability.	Video: Loading Data
ALTER	Modifying the table structure by adding/removing columns, changing or adding constraints.	Video: Creating Tables
ALTER TABLE Statement	Used for: Modifying the structure of an existing table.	Video: ALTER, DROP, and Truncate Tables
ANSI SQL standards	Complies with international standards for SQL syntax and functionality.	Video: PostgreSQL
API	Application Programming Interface for programmatic access to data or functionality.	Video: Database Architecture
Application Developers	Build applications that access databases read/write through programming languages and APIs like ODBC, JDBC, REST APIs, or ORMs like Hibernate and Django.	Video: Database Usage Patterns
Application Server	Encapsulates application logic, and communicates with the database and client.	Video: Database Architecture
Attribute	A characteristic or property of an entity (book title, author name).	Video: Information and Data Models

Backup	Creates a copy of the entire database for disaster recovery or creating additional copies.	Video: Data Movement Utilities
BI	Business Intelligence refers to using technologies, processes, and tools to analyze and present business data for decision-making purposes.	Video: Db2
Binary String	Stores binary data like images or video (BLOB).	Video: Data Types
Boolean	Stores true/false values (TRUE/FALSE).	Video: Data Types
Business Applications	Custom or off-the-shelf applications for specific business functions like e-commerce or supply chain management.	Video: Database Usage Patterns
Business Logic Layer	Contains application rules and processes data.	Video: Database Architecture
Cardinality	The number of tuples in a relation (a relation with 10 tuples has a cardinality of 10).	Video: Relational Model Concepts
Character String	Stores text data. Can be fixed-length (CHAR) or variable-length (VARCHAR).	Video: Data Types
Check Constraint	Defines additional rules beyond data types and domains for specific attributes.	Video: Relational Model Constraints - Advanced
CLI	Command Line Interface for interacting with a database through text commands.	Video: Database Architecture
Client Tier	Application running on the user's system with a database interface (API/Framework).	Video: Database Architecture
Client-Server (2-Tier)	Database on a remote server, accessed by client applications through APIs or interfaces.	Video: Database Architecture
Client-Server Architecture	A network-based model with separate client and server systems.	Video: Database Architecture
Cloud	Database resides in a cloud environment, accessed through cloud-based interfaces or application servers.	Video: Database Architecture
Cloud Database	Database service hosted and accessed through a cloud platform.	Video: Introduction to Relational Database Offerings
Column	A vertical section of a table containing data of a specific attribute.	Video: Mapping Entities to Tables

Command-Line Interfaces (CLIs)	Powerful for experienced users and ideal for automation and scripting.	Video: Database Usage Patterns
Commercial Database	Proprietary database with a paid license for use.	Video: Introduction to Relational Database Offerings
Commercial License	Database requires purchase for use, like Oracle, Microsoft SQL Server.	Video: Introduction to Relational Database Offerings
Common file formats	DEL (delimited ASCII), ASC (non-delimited ASCII), PC/IXF, JSON.	Video: Data Movement Utilities
Constraint	A rule that enforces data integrity in a table (primary key, foreign key).	Video: Creating Tables
CREATE	Creates a new database object.	Video: Types of SQL Statements (DDL vs DML)
CREATE TABLE Statement	A Data Definition Language (DDL) statement is used to create a new table in a database. Syntax: SQL CREATE TABLE table_name (column1 datatype constraint1, column2 datatype constraint2, and so on)	Video: CREATE TABLE Statement
Crow's Foot Notation	A graphical representation of relationship sets using symbols like lines, arrows, and diamonds.	Video: ERDs and Type of Relationships
Data	Unorganized information is processed to become meaningful.	Video: Review of Data Fundamentals
Data Access Layer	Interfaces for different clients (APIs, CLI, vendor-specific).	Video: Database Architecture
Data Definition Language (DDL)	Used for defining, creating, modifying, or dropping database objects (tables, views, indexes, and so on).	Video: Types of SQL Statements (DDL vs DML)
Data Engineers	Manage database creation, access control, performance tuning, and use tools like GUI/web management, CLI interfaces, and APIs.	Video: Database Usage Patterns
Data Manipulation Language (DML)	Used for reading, inserting, updating, and deleting data in tables. Also known as CRUD operations (Create, Read, Update, Delete).	Video: Types of SQL Statements (DDL vs DML)

Data Model	A concrete representation of an information model, specifying how data will be stored and accessed in a specific system.	Video: Information and Data Models
Data Movement	The process of transferring data into or out of a database.	Video: Data Movement Utilities
Data Science and BI Tools	Jupyter, Excel, PowerBI, and Tableau for analysis, reporting, and visualizations.	Video: Database Usage Patterns
Data Scientists and Business Analysts	Analyze data for insights and predictions using tools like Jupyter, R Studio, Excel, PowerBI, and Tableau. They typically use SQL interfaces and APIs or abstractions provided by these tools.	Video: Database Usage Patterns
Data source	Any system or location actively providing data.	Video: Review of Data Fundamentals
Database	A collection of organized data, typically stored electronically in tables.	Video: Database Usage Patterns
Database Client/API	Installed on the client system, communicates with the database server.	Video: Database Architecture
Database dependencies	Viewing other database objects that the table relies on.	Video: Creating Tables
Database Engine Layer	Compiles queries, retrieves/processes data, and returns results.	Video: Database Architecture
Database Interface	Connects the client tier to the database server, often language-specific (JDBC, ODBC).	Video: Database Architecture
Database Management System (DBMS)	Software on the server that manages a database and executes queries.	Video: Relational Model Concepts
Database Management Tools	phpMyAdmin and pgAdmin are used for managing database objects and users.	Video: Database Usage Patterns
Database Server	Responsible for managing and storing the database, executing queries, and handling data access.	Video: Database Architecture
Database Storage Layer	Physical storage for data (local, network, specialized appliances).	Video: Database Architecture
Date/Time	Stores dates (DATE), times (TIME), or both (TIMESTAMP).	Video: Data Types
Db2	A suite of database management products including relational databases, data warehouses, and cloud options.	Video: Db2

Define	Set character encoding, delimiter, column headings, and time/date formats for text files.	Video: Loading Data
Degree	The number of attributes in a relation (a relation with 5 attributes has a degree of 5).	Video: Relational Model Concepts
DELETE	Removes rows of data from a table.	Video: Types of SQL Statements (DDL vs DML)
Deployment Topology	Arrangement of hardware and software for a database system.	Video: Database Architecture
Diamond	Represents a relationship set.	Video: ERDs and Type of Relationships
Disaster Recovery (DR) Replica	Geographically distant copy of the database for disaster scenarios.	Video: Distributed Databases
Distributed Relational Database	A database that shares tables and objects across multiple interconnected computer systems.	Video: Loading Data
Domain	The set of valid values allowed for an attribute (e.g., strings, integers, dates).	Video: Relational Model Concepts
Domain Constraint	Specifies the allowed values for a specific attribute.	Video: Relational Model Constraints - Advanced
Double-sided Crow's Foot (>-<)	Indicates a many-to-many relationship where multiple entities can participate in multiple relationships.	Video: ERDs and Type of Relationships
DROP	Deletes a database object permanently.	Video: Types of SQL Statements (DDL vs DML)
DROP TABLE Statement	Used for: Deleting an entire table from the database, including all its data. Syntax: DROP TABLE table_name; Example: DROP TABLE author;	Video: ALTER, DROP, and Truncate Tables
Dropping a column	ALTER TABLE author DROP COLUMN telephone_number;	Video: ALTER, DROP, and Truncate Tables
Enterprise	Dedicated instance with flexible scaling and three-node high availability.	Video: MySQL
Entity	A real-world object or concept is represented as a table in the database (Book, Author).	Video: Information and Data Models

Entity Integrity Constraint	Ensures each row (tuple) in a table has a unique identifier (primary key). Also known as Primary Key Constraint or Unique Constraint.	Video: Relational Model Constraints - Advanced
Entity-Relationship Diagram (ERD)	A graphical representation of entities, their attributes, and relationships in a database.	Video: Mapping Entities to Tables
Entity-Relationship Model (ER Model)	Captures entities (things) and their relationships in a diagram, used to design relational databases.	Video: Information and Data Models
Export	Retrieves information from a table and saves it to a file. Supported by various interfaces (command line, APIs, graphical tools).	Video: Data Movement Utilities
Failover	Automatic switching to a replica if the primary server fails.	Video: MySQL
Finalize	Review settings and initiate the loading process.	Video: Loading Data
First Normal Form (1NF)	Each row is unique (no duplicates). Each cell contains a single value (no repeating groups).	Video: Normalization
Flat file	A simple text file actively storing data in rows, often delimited by characters like commas or tabs.	Video: Review of Data Fundamentals
Foreign Key	Attribute in one relation referencing the primary key of another relation, representing a relationship.	Video: Relational Model Concepts
Fork	Branching of an existing software project in a new direction.	Video: MySQL
Fully qualified name	The complete name of a database object, including its schema name (CQC63405.EmployeeDetails).	Video: Creating Tables
General Public License (GPL)	Popular open source license requiring source code sharing for modifications.	Video: Introduction to Relational Database Offerings
Generate SQL code	Creating SQL statements for actions like selecting, inserting, updating, or deleting data in the table.	Video: Creating Tables
GNU GPL	Open-source license requiring source code sharing for modified versions.	Video: MySQL
Graphical User Interface (GUI)	A visual interface for interacting with a database, is often used for creating and managing tables.	Video: Creating Tables

Greater-than Symbol (>)	Indicates a many-to-one relationship where one entity can participate in multiple relationships.	Video: ERDs and Type of Relationships
GUI/Web Management Tools	Easy-to-use visual interfaces for database administration.	Video: Database Usage Patterns
Hierarchical Model	Depicts data in a tree-like structure, featuring relationships between parent and child elements.	Video: Information and Data Models
High Availability (HA) Replica	Copy of the primary database within the same location for quick failover.	Video: Distributed Databases
HSTORE	Supports storing key-value pairs of non-hierarchical data.	Video: PostgreSQL
Import	Reads data from a file and inserts it into a specific table using INSERT statements.	Video: Data Movement Utilities
Index	A data structure that enhances the speed of data retrieval by providing pointers to specific data locations within tables.	Video: Loading Data
Information Model	An abstract representation of entities, their properties, relationships, and operations, independent of implementation details.	Video: Information and Data Models
Inheritance	Creating database objects that inherit properties from other objects.	Video: PostgreSQL
InnoDB	Default engine supports transactions, row-level locking, clustered indexes, and foreign keys.	Video: MySQL
INSERT	Adds new rows of data to a table.	Video: Types of SQL Statements (DDL vs DML)
Instance	A logical boundary that encapsulates a database or set of databases, providing a structured environment with configuration parameters and system catalog tables.	Video: Loading Data
JDBC	Java Database Connectivity API for accessing databases from Java applications.	Video: Database Architecture
JSON (JavaScript Object Notation)	A lightweight language for data exchange, popular for API responses and web services.	Video: Review of Data Fundamentals
LAMP Stack	Popular web development stack with Linux and Apache.	Video: MySQL
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		PostgreSQL
Large Object (LOB)	Stores very large data outside the main table (CLOB, TEXT).	Video: Data Types
Leading Cloud Databases	Amazon DynamoDB, Microsoft Azure Cosmos DB, Google BigQuery, Amazon Redshift.	Video: Introduction to Relational Database Offerings
Less-than Symbol (<)	Indicates a one-to-many relationship where one entity can participate in multiple relationships.	Video: ERDs and Type of Relationships
Line	Connects entities to the relationship set.	Video: ERDs and Type of Relationships
Lite	Free plan with a 200MB data limit and 15 connections.	Video: Db2
Load balancing	Distributing workload across multiple servers to improve performance.	Video: MySQL
Logical Data Independence	Ability to modify the database schema (tables, columns) without affecting how users access data.	Video: Information and Data Models
Many-to-Many Relationship	Multiple entities in both sets associate with each other in multiple relationships.	Video: ERDs and Type of Relationships
Many-to-One Relationship	Multiple entities in one set associate with one entity in the other set.	Video: ERDs and Type of Relationships
MariaDB	Open-source database fork of MySQL, led by some original developers.	Video: MySQL
Modifying a column's data type	ALTER TABLE author ALTER COLUMN telephone_number SET DATA TYPE CHAR(20);	Video: ALTER, DROP, and Truncate Tables
MyISAM	Faster for read-heavy workloads but lacks transaction support and uses table-level locking.	Video: MySQL
MySQL	An open-source object-relational database management system (ORDBMS).	Video: MySQL
NDB	Clustered engine for high availability and scalability, uses multiple data nodes.	Video: MySQL
Non-relational database	A database that stores data in flexible formats, not adhering to the rigid structure of relational databases.	Video: Review of Data Fundamentals

Normal Forms	First Normal Form (1NF): Each row is unique (no duplicates). Each cell contains a single value (no repeating groups).	Video: Normalization
Normalization	Process of organizing data in tables to avoid redundancy and inconsistencies.	Video: Relational Model Concepts
Null Constraint	Controls whether an attribute can accept null values (representing unknown data).	Video: Relational Model Constraints - Advanced
Null value	An absence of a value in a column.	Video: Creating Tables
Numeric	Stores whole numbers (INT, SMALLINT, BIGINT) or decimal numbers (DECIMAL, FLOAT, DOUBLE).	Video: Data Types
Object-relational	Combines features of relational databases with object-oriented concepts.	Video: MySQL
Object-Relational Mapping (ORMs)	Frameworks simplify database access for developers by masking the complexity of SQL and relational models.	Video: Database Usage Patterns
ODBC	Open Database Connectivity standard for accessing databases from various languages.	Video: Database Architecture
One-to-Many Relationship	One entity in one set associates with one or more entities in the other set.	Video: ERDs and Type of Relationships
One-to-One Relationship	Each entity in one set associates with exactly one entity in the other set.	Video: ERDs and Type of Relationships
Online Analytical Processing (OLAP)	A system optimized for complex data analysis.	Video: Review of Data Fundamentals
Online Transaction Processing (OLTP)	A system optimized for handling high-volume, day-to-day operational data.	Video: Review of Data Fundamentals
Open-Source Database	Software with a freely available source code that is free to use and modify.	Video: Introduction to Relational Database Offerings
Open-Source License	Database freely available to use and modify, e.g., MySQL, PostgreSQL.	Video: Introduction to Relational

		Database Offerings
Overloading	Defining multiple actions for the same operator based on its operands.	Video: PostgreSQL
Partition	Logical division of a table into smaller subsets based on data characteristics (e.g., date range, customer ID).	Video: Distributed Databases
Physical Data Independence	Ability to change the physical storage of data (for example, disk layout) without affecting how users' access or manipulate data.	Video: Information and Data Models
PostgreSQL (Postgres)	An open-source object-relational database management system (ORDBMS).	Video: PostgreSQL
PostgreSQL License	Permissive open source license allowing modification without sharing source code.	Video: Introduction to Relational Database Offerings
Presentation Layer	User interface (desktop app, web browser, mobile app).	Video: Database Architecture
Primary Key	Unique identifier for each tuple in a relation.	Video: Relational Model Concepts
Public Domain	Software with no copyright restrictions, freely usable and modifiable.	Video: Introduction to Relational Database Offerings
Query	An SQL statement is used to retrieve, manipulate, or analyze data in a database.	Video: Types of SQL Statements (DDL vs DML)
Rectangle	Represents an entity set.	Video: ERDs and Type of Relationships
Referential Integrity Constraint	Defines and maintains valid relationships between tables. Achieved through primary keys (parent tables) and foreign keys (child tables).	Video: Relational Model Constraints - Advanced
Relational database	A database that stores data in related tables linked by defined relationships.	Video: Review of Data Fundamentals
Relational Database	Software that manages relational databases and their supporting systems.	Video: Review of Data Fundamentals

Management System (RDBMS)		
Relational Instance	A specific realization of a relation containing actual data values in its tuples.	Video: Relational Model Concepts
Relational Model	Stores data in tables with rows and columns, supporting flexible queries and data manipulation.	Video: Information and Data Models
Relational Schema	The definition of a relation, including its name, attributes, and their data types.	Video: Relational Model Concepts
Relationship	Connection between two entities (for example, "written by" between Book and Author).	Video: Information and Data Models
Relationship Set	A collection of relationships between two or more entities (for example, "written by" between Book and Author).	Video: ERDs and Type of Relationships
Replication	Copying data to one or more replicas for redundancy and improved read performance.	Video: MySQL
Restore	Creates an exact replica of the database from a backup file. Preserves all database objects and data.	Video: Data Movement Utilities
Row	A horizontal section of a table containing data for a specific record.	Video: Mapping Entities to Tables
Scalability	Ability of a system to handle increasing data and workload.	Video: Introduction to Relational Database Offerings
Script file	A text file containing a series of SQL statements is often used for automating tasks like creating multiple tables.	Video: Creating Tables
Second Normal Form (2NF)	Meets all requirements of 1NF.No non-key columns depend on only part of the primary key.	Video: Normalization
SELECT	Retrieves data from a table based on specific criteria.	Video: Types of SQL Statements (DDL vs DML)
Semantic Integrity Constraint	Focuses on the meaning and validity of data within a table.	Video: Relational Model Constraints - Advanced
Semi-structured data	Data with some organizational features but not enough for a rigid, tabular structure.	Video: Review of Data Fundamentals

Set	An unordered collection of distinct elements, represented by curly braces {}.	Video: Relational Model Concepts
Sharding	Placement of partitions on separate nodes with dedicated compute resources for parallel processing and scalability.	Video: Distributed Databases
Single-Tier	Database resides on the user's local system, suitable for small databases with limited access.	Video: Database Architecture
Software-as-a-Service (SaaS)	Software delivery model where applications are accessed via the cloud.	Video: Introduction to Relational Database Offerings
Source	Specify the location and type of your source data (local file, cloud storage).	Video: Loading Data
Spreadsheet	A software application that organizes data in rows and columns.	Video: Review of Data Fundamentals
SQL Interfaces & APIs	Programmatic access for data retrieval and manipulation.	Video: Database Usage Patterns
Standard	Flexible scaling and built-in three-node high availability.	Video: Db2
Standard SQL	Supports querying data using the Structured Query Language (SQL).	Video: MySQL
Storage engines	InnoDB, MyISAM, NDB.	Video: MySQL
Structured data	Data is organized in a fixed format, like rows and columns in a table.	Video: Review of Data Fundamentals
System Schema	A specialized schema containing configuration information and metadata about the database itself.	Video: Creating Tables
Table	A structured compilation of interconnected data arranged in both rows and columns.	Video: Mapping Entities to Tables
Target	Select the target schema and table for the data. Choose to append or overwrite existing data.	Video: Loading Data
Third Normal Form (3NF)	Meets all requirements of 2NF. No non-key columns depend on any other non-key columns.	Video: Normalization
TRUNCATE	Removes all data from a table but retains the table structure.	Video: Types of SQL Statements (DDL vs DML)
TRUNCATE TABLE Statement	Used for: Deleting all rows of data from a table but retaining the table structure. Syntax: TRUNCATE TABLE	Video: ALTER, DROP, and Truncate Tables

	table_name IMMEDIATE; Example: TRUNCATE TABLE author IMMEDIATE;	
Tuple	A single row in a relation containing data for each attribute.	Video: Relational Model Concepts
Unstructured data	Data without a specific format or structure, like text, images, or audio.	Video: Review of Data Fundamentals
UPDATE	Modifies existing data in a table.	Video: Types of SQL Statements (DDL vs DML)
User schema	The schema associated with a particular user, containing their database objects.	Video: Creating Tables
User-Defined Data Type (UDT)	Custom data type created from built-in types.	Video: Data Types
Vertical Line	Indicates a mandatory one-to-one relationship.	Video: ERDs and Type of Relationships
MySQL Cluster	Provides high availability and scalability with the NDB engine and data nodes.	Video: MySQL
MySQL Router	Load balances client connections across multiple servers.	Video: MySQL
View	A virtual table that presents data from one or more underlying tables in a customized way without storing the data itself.	Video: Loading Data
XML (Extensible Markup Language)	A language for structuring and transporting data on the internet.	Video: Review of Data Fundamentals