Database

databases

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A database is a collection of related information organized in a logical way for rapid search and retrieval.

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Record

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A record is a set of related fields in a database about a person or thing.

A personnel database might contain a record that contains: "Timmy Chen", "155 Tianmu East Road", "Taipei".

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Field

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Fields provide the categories for the details describing each record.

Example: Name, address, and phone number would be fields.

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Table

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Tables contain sets of records organised into rows, with fields displayed as columns.

These can be "standalone", or can be linked to other tables by the use of relationships.

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Data Types

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Categories of data that are used to help classify it to ensure consistency.

Examples include: alphanumeric, numeric, currency, date/time, lookup & Boolean.

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Alphanumeric

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Contains a combination of letters and numbers.

For example, a UK postcode: "NE4 3AQ", a street address containing the house number: "4 Willow Drive".

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Currency

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Numerical data formatted as currency, usually with symbol and two decimal places.

For example: "$499.99", "€10.00", "¥250.00"

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Date/time

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Date stored in one of several formats set by the database creator.

For example: "19-Jan-04", "14/04/07".

Note that we always use British formatting: DD/MM/YY

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Number

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Numerical data stored as an integer or decimal.

For example: "200", "49.534".

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Lookup

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Field is entered from a pre-existing list of options set by the database creator.

For example, personal titles: "Mr, Mrs, Miss, Ms", days of the week or available car colours.

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Boolean

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A field that can only have two possible values.

For example: "on/off", "true/false", "male/female".

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Form

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A form is a data entry tool, used to enter data into a table in a simple, clear way.

Forms may include checkboxes, drop-down lists and other features linked to validation rules to avoid making mistakes.

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Query

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A query is used to retrieve information from the database.

Simple queries contain only one criterion in one field, e.g. all R&B songs in a music database whereas complex queries contain more than one, e.g. all brown cars made by Mitsubishi in 2012.

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Report

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A report is a document that presents information in a clear, professional way.

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Sort

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To organize data alphabetically or in numerical order.

To sort in ascending order is from smallest to largest (A to Z and 0 to 9).

To sort in descending order is from largest to smallest (Z to A and 9 to 0).

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Primary key

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A field that uniquely identifies each record in a table.

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Foreign key

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A foreign key is a key field from another table that has been used to create a relationship.

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Wizard

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A predefined group of settings for creating a new table, query or report, including data types, validation rules, formatting, etc.

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Design view

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A view in which you can add, edit, and delete fields from the table, change field types and descriptions, set a primary key, and more.

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Flat-file database

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A database that contains only one table.

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Relational database

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A database that contains more than one table. The tables are linked by a relationship based on **primary keys**.

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Referential integrity

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Enforcing referential integrity forces the database to ensure that data is linked as-intended.

This option is used to enforce **one-to-one**, **one-to-many** & **many-to-many** relationships between tables. This can prevent the accidental duplication of data.

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One-to-one

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When every record in table A matches only one record in table B, this is a one-to-one relationship.

An example could be married couples. One husband has one wife & vice-versa.

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One-to-many

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When each record in table A can match more than one record in table B, this is a one-to-many relationship.

A mother may have one or more children, but they only have one mother.

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Many-to-many

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When any record in table A can match more than one record in table B and vice-versa, this is a many-to-many relationship.

Many readers may borrow many books in a library database. This can be quite messy, and can be avoided by adding a **junction table**.

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Junction table

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Junction tables are created to avoid many-to-many relationships.

For a library system, a 'loans' table may be added to link the 'borrowers' and 'books' tables and avoid the large amount of duplication that would happen otherwise.

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Query operators

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Used in query criteria.

Operators include =, <, >, <=, >=, <>, **and**, **or**, **not**, **between**.

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Wildcard

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Wildcard searches find results similar to the search operator.

Searching for "Ch*" in a student database might display records such as Chang, Chretien & Christophe.

Searching for "*love*" in the title field of a CD database would display songs with 'love' in the title.

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Calculated field

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Calculated fields can be used to add totals, averages etc to fields displayed in a report.

You might, for example, want to display the total value of current stock by using a calculated field.

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Entity

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An entity is a concept, person, place or thing about which can be collected. For example: student, address, engine capacity.

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