



Arranging related data

For maximum efficiency, databases store their data in related tables that contain records and fields.

Data

The term “data” refers to the information stored within a database. The data is best broken into individual items for greater flexibility. For example, names such as “John Smith” are best broken into forename “John” and surname “Smith”, so a collection of names could be sorted by first name or be sorted by last name.

Tables

A “Table” is the format in which a database stores items of data. For example, a transactions Table with columns for number, date, amount, and client stores each transaction on a separate row:

TransactionNumber	TransactionDate	Amount	Client
1	01-Oct-20	\$15.00	Tasty Bakery
2	01-Oct-20	\$48.00	TV Center
3	01-Oct-20	\$23.50	Fresh Mart
4	02-Oct-20	\$34.00	Bargain Shop
5	02-Oct-20	\$18.75	Fresh Mart
6	03-Oct-20	\$15.00	Tasty Bakery
7	03-Oct-20	\$52.00	Pizza Pot
8	03-Oct-20	\$68.00	TV Center



Data stored in a single Table format is known as a “flat-file system”, such as an Excel spreadsheet. Relational databases are better at avoiding duplication for accounting, inventory, and invoicing purposes.

Relationships

A “relational” database is a collection of Tables containing data, which are related to each other through common items. For example, a Table of clients, storing name and address data, could be related to the Table above by the “Client” column item. This provides maximum flexibility and is the most efficient database design. An Access database must contain at least two Tables to be considered relational.

To be used most effectively an Access database will, therefore, contain more than one Table. In a relational database a Table is based upon a particular concept or entity, typically something concrete such as a car, and holds data specific to that particular entity. For example, in a bank database you might have a customer Table that holds data about the customers of that bank, such as their names, their sex, and the amount of cash they have invested with the bank.

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Another Table you might see in a bank database is an account Table, which describes the type of account a particular customer holds as well as the current balance. A Table consists of a number of columns, more formally known as “fields”, and a number of rows, more formally known as “records”. Logical links between Tables are called relationships.

Fields

A “field” is the technical name for a database Table column and is used to denote a specific type of data. For example, in a car Table you might have a color field denoting the color of a car. The “Sex” field (column) below contains text data denoting customer gender:

Sex
Male
Male
Female
Male
Female
Male

Records

A “record” is the technical name for a database Table row and contains the actual data in a Table. Whereas a field describes the type of data in a Table, such as customer gender, a record denotes whether a particular customer is male or female. If you think of a Table as a description of an object, such as a car, then the records (rows) of a Table represent the actual cars:

CarNumber	Model	EngineSize	Transmission
1	Highlander	4.0	Auto
2	Highlander	3.0	Auto
3	Costa	1.4	Manual
4	CostaSport	2.0	Manual
5	Siesta	1.0	Auto

Record: 5 of 5 No Filter Search

Although it’s tempting to refer to a field as a column, and a record as a row, this can cause confusion between fields and other objects. This book generally refers to data in a Table column as a field, and data in a Table row as a record.



Each field in a Table holds only one type of data; for example, text data describing gender.



Each record in a Table contains the same fields but (usually) has different data in those fields.