**Introduction**

Completed100 XP

* 2 minutes

In the early years of computing systems, every application stored data in its own unique structure. When developers wanted to build applications to use that data, they had to know a lot about the particular data structure to find the data they needed. These data structures were inefficient, hard to maintain, and hard to optimize for good application performance. The *relational* database model was designed to solve the problem of multiple arbitrary data structures. The relational model provides a standard way of representing and querying data that can be used by any application. One of the key advantages of the relational database model is its use of *tables*, which are an intuitive, efficient, and flexible way to store and access structured information.

The simple yet powerful relational model is used by organizations of all types and sizes for a broad variety of information management needs. Relational databases are used to track inventories, process ecommerce transactions, manage huge amounts of mission-critical customer information, and much more. A relational database is useful for storing any information containing related data elements that must be organized in a rules-based, consistent structure.

In this module, you'll learn about the key characteristics of relational databases, and explore relational data structures.

**Learning objectives**

In this module you will learn how to:

* Identify characteristics of relational data
* Define normalization
* Identify types of SQL statement
* Identify common relational database objects

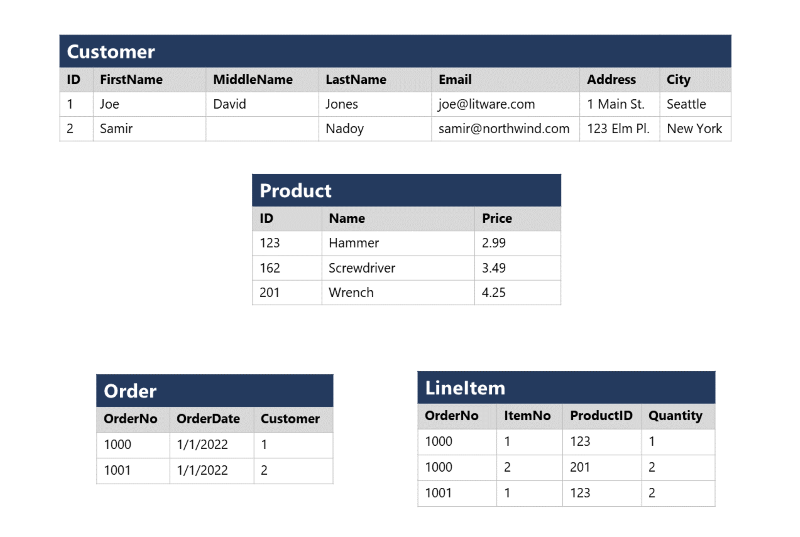
**Next unit: Understand relational data**

**Understand relational data**

Completed100 XP

* 6 minutes

In a relational database, you model collections of entities from the real world as *tables*. An entity can be anything for which you want to record information; typically important objects and events. For example, in a retail system example, you might create tables for customers, products, orders, and line items within an order. A table contains rows, and each row represents a single instance of an entity. In the retail scenario, each row in the customer table contains the data for a single customer, each row in the product table defines a single product, each row in the order table represents an order made by a customer, and each row in the line item table represents a product that was included in an order.



Relational tables are a format for structured data, and each row in a table has the same columns; though in some cases, not all columns need to have a value – for example, a customer table might include a **MiddleName** column; which can be empty (or *NULL*) for rows that represent customers with no middle name or whose middle name is unknown).

Each column stores data of a specific datatype. For example, an **Email** column in a **Customer** table would likely be defined to store character-based (text) data (which might be fixed or variable in length), a **Price** column in a **Product** table might be defined to store decimal numeric data, while a **Quantity** column in an **Order** table might be constrained to integer numeric values; and an **OrderDate** column in the same **Order** table would be defined to store date/time values. The available datatypes that you can use when defining a table depend on the database system you are using; though there are standard datatypes defined by the American National Standards Institute (ANSI) that are supported by most database systems.

**Next unit: Understand normalization**