In computing, a database is an organized collection of data or a type of data store based on the use of a database management system (DBMS), the software that interacts with end users, applications, and the database itself to capture and analyze the data. The DBMS additionally encompasses the core facilities provided to administer the database. The sum total of the database, the DBMS and the associated applications can be referred to as a database system. Often the term "database" is also used loosely to refer to any of the DBMS, the database system or an application associated with the database.  
Small databases can be stored on a file system, while large databases are hosted on computer clusters or cloud storage. The design of databases spans formal techniques and practical considerations, including data modeling, efficient data representation and storage, query languages, security and privacy of sensitive data, and distributed computing issues, including supporting concurrent access and fault tolerance.  
Computer scientists may classify database management systems according to the database models that they support. Relational databases became dominant in the 1980s. These model data as rows and columns in a series of tables, and the vast majority use SQL for writing and querying data. In the 2000s, non-relational databases became popular, collectively referred to as NoSQL, because they use different query languages.  
Terminology and overview  
Formally, a "database" refers to a set of related data accessed through the use of a "database management system" (DBMS), which is an integrated set of computer software that allows users to interact with one or more databases and provides access to all of the data contained in the database (although restrictions may exist that limit access to particular data). The DBMS provides various functions that allow entry, storage and retrieval of large quantities of information and provides ways to manage how that information is organized.  
Because of the close relationship between them, the term "database" is often used casually to refer to both a database and the DBMS used to manipulate it.  
Outside the world of professional information technology, the term database is often used to refer to any collection of related data (such as a spreadsheet or a card index) as size and usage requirements typically necessitate use of a database management system.  
Existing DBMSs provide various functions that allow management of a database and its data which can be classified into four main functional groups:  
Data definition – Creation, modification and removal of definitions that detail how the data is to be organized.  
Update – Insertion, modification, and deletion of the data itself.  
Retrieval – Selecting data according to specified criteria (e.g., a query, a position in a hierarchy, or a position in relation to other data) and providing that data either directly to the user, or making it available for further processing by the database itself or by other applications. The retrieved data may be made available in a more or less direct form without modification, as it is stored in the database, or in a new form obtained by altering it or combining it with existing data from the database.

Administration – Registering and monitoring users, enforcing data security, monitoring performance, maintaining data integrity, dealing with concurrency control, and recovering information that has been corrupted by some event such as an unexpected system failure.  
Both a database and its DBMS conform to the principles of a particular database model. "Database system" refers collectively to the database model, database management system, and database.  
Physically, database servers are dedicated computers that hold the actual databases and run only the DBMS and related software. Database servers are usually multiprocessor computers, with generous memory and RAID disk arrays used for stable storage. Hardware database accelerators, connected to one or more servers via a high-speed channel, are also used in large-volume transaction processing environments. DBMSs are found at the heart of most database applications. DBMSs may be built around a custom multitasking kernel with built-in networking support, but modern DBMSs typically rely on a standard operating system to provide these functions.  
Since DBMSs comprise a significant market, computer and storage vendors often take into account DBMS requirements in their own development plans.  
Databases and DBMSs can be categorized according to the database model(s) that they support (such as relational or XML), the type(s) of computer they run on (from a server cluster to a mobile phone), the query language(s) used to access the database (such as SQL or XQuery), and their internal engineering, which affects performance, scalability, resilience, and security.  
History  
The sizes, capabilities, and performance of databases and their respective DBMSs have grown in orders of magnitude. These performance increases were enabled by the technology progress in the areas of processors, computer memory, computer storage, and computer networks. The concept of a database was made possible by the emergence of direct access storage media such as magnetic disks, which became widely available in the mid-1960s; earlier systems relied on sequential storage of data on magnetic tape. The subsequent development of database technology can be divided into three eras based on data model or structure: navigational, SQL/relational, and post-relational.  
The two main early navigational data models were the hierarchical model and the CODASYL model (network model). These were characterized by the use of pointers (often physical disk addresses) to follow relationships from one record to another.  
The relational model, first proposed in 1970 by Edgar F. Codd, departed from this tradition by insisting that applications should search for data by content, rather than by following links. The relational model employs sets of ledger-style tables, each used for a different type of entity. Only in the mid-1980s did computing hardware become powerful enough to allow the wide deployment of relational systems (DBMSs plus applications). By the early 1990s, however, relational systems dominated in all large-scale data processing applications, and as of 2018 they remain dominant: IBM Db2, Oracle, MySQL, and Microsoft SQL Server are the most searched DBMS. The dominant database language, standardized SQL for the relational model, has influenced database languages for other data models.