features	Relational databases	NoSQL databases
definition	Store structured data for queries in the SQL language.	Store unstructured or semi-structured data, using non-SQL language queries.
advantages	Support the ACID properties for transactions, easy to understand and use.	Can be expanded horizontally, and adapted to large-scale datasets.
limitations	Limited scalability, especially when processing large amounts of data.	Complex queries are not supported, and the data consistency guarantee is weak.
Software examples	MySQL, Oracle, Microsoft SQL Server	MongoDB, Cassandra, CouchDB
Use Cases	banking systems, human resource management, transactions.	Social media platform, real-time Web application, the Internet of Things (IoT).
characteristic	Relational databases	NoSQL databases
Database structure - the type of data and how it is stored	Table form that stores structured data through rows and columns.	Depending on the type, such as a key value pair, document, column family, or graph database.
Data storage - The amount of data	suitable for a medium-sized dataset.	Suitable for large-scale datasets, especially in distributed environments
ACID transaction support	Full support.	Supported supported or not, depending on the specific NoSQL database type.
Whether normalization is supported	Support normalization used to reduce data redundancy and improve data integrity.	Normalization is not supported in most cases to optimize the read performance.
Integrity constraint - Data accuracy	enforce integrity constraints such as foreign bond relationships.	May not enforce integrity constraints and depend on application logic.
Scalability - Horizontal and vertical scaling	Vertical extension is mainly: increase the resources of a single server.	Horizontal extension to spread the load by adding more nodes.
Simplicity - Ease of use and support	Easy to use for people familiar with SQL, with rich tool support.	New learning curves may be required that support varies from database to database.

Complexity - cost	There may be a higher license cost and a dedicated DBA is required	There are many open source options, which reduces the initial investment, but may increase the operation and maintenance costs.
reliability	High reliability in general, especially for transaction processing	Reliability varies from implementation to implementation, but is typically designed for high availability.
Schema Flexibility	Fixed mode, changing mode may require downtime	Dynamic mode that allows data structures to be changed at runtime.
Performance - Read & Write	Excellent for simple queries and transactions	It performs better for large data sets and parallel read and write operations.
Storage requirements	Typically takes up less storage space because normalization reduces duplication	May take up more storage space because denormalization is often used to improve read speeds

Comprehensive comparison between relational databases and NoSQL databases