

# Computer Basics: Database

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<https://yasirbhutta.github.io/computer-basics/docs/database.html>

## Database Basics

### What is a database?

- A database is an organized collection of data, or information, that is stored electronically on a computer system.
- Databases are used to store a wide variety of data, such as customer information, product information, financial data, and scientific data.

### Why use a database?

- Databases offer a number of advantages over traditional methods of data storage, such as paper files and spreadsheets.
- Databases are **more efficient** to store and manage large amounts of data.
- Databases allow for **easy searching and retrieval of data**.
- Databases can be used to **share data** with other users.

### Types of databases:

- There are many different types of databases, but the most common are **relational databases** and **non-relational databases**.
  - **Relational databases** store data in tables, where each table is made up of rows and columns.
  - **Non-relational databases** store data in a variety of formats, such as XML or JSON.

## Database Design

- Database design is the process of creating a database that is efficient and meets the needs of the users.
- There are a number of steps involved in database design, such as:
  - Identifying the data that needs to be stored
  - Determining the relationships between the data
  - Normalizing the data
  - Creating a database schema

## Database Management Systems (DBMS)

- A database management system (DBMS) is a software program that is used to **create, manage, and access databases**.
- Some popular DBMSs include **Oracle, MySQL, and Microsoft SQL Server**.

## SQL

- SQL is a structured query language that is used to **communicate with databases**.
- SQL can be used to create, read, update, and delete data in a database.

#### See Also:

- Khan Academy Database Course: <https://www.khanacademy.org/computing/computer-programming/sql>
- W3Schools SQL Tutorial: <https://www.w3schools.com/sql/>

## Microsoft Access

**Microsoft Access** is a **database management system (DBMS)** developed by Microsoft. It combines the **relational Access Database Engine (ACE)** with a **graphical user interface (GUI)** and software-development tools. Here's what you can do with Microsoft Access:

1. **Create Databases:** You can build databases quickly using templates, even if you're not a developer.
2. **Data Management:** Easily find, report on, and manipulate data stored in Access.
3. **Forms:** Create rich data entry forms.
4. **Data Import/Export:** Import, transform, and export data from various sources<sup>12</sup>.

#### See also:

- [Video: What is Access? - Microsoft Support](#)
- [Microsoft Access - Wikipedia](#)
- [What is Microsoft Access? - Database.Guide](#)
- [Access video training - Microsoft Support](#)
- [What is Microsoft Access? Database Management Simplified - Simplilearn](#)

## True/False (Mark T for True and F for False)

- A database is an organized collection of data stored electronically on a computer system. **True/False**
- Databases are only used to store customer information. **True/False**
- Relational databases store data in tables. **True/False**
- SQL is a programming language used to create websites. **True/False**
- SQL is a language used to communicate with and manipulate data within a database. **True/False**

## Multiple Choice (Select the best answer)

Which of the following is NOT a type of database?

1. ☐ Relational
2. ☐ Non-relational
3. ☐ Spreadsheet

What is the purpose of database design?

1. ☐ To make the database look pretty
2. ☐ To create a database that is efficient and meets the needs of the users
3. ☐ To store as much data as possible
4. ☐ None of the above

Which of the following is NOT a characteristic of a database?

- ☐ Organized collection of data
- ☐ Stored electronically on a computer system
- ☐ Duplicates information across different files
- ☐ Allows easy searching and retrieval of data

Which type of database stores data in tables with rows and columns?

- ☐ Relational
- ☐ Non-relational
- ☐ Hierarchical
- ☐ Graph

What is the process of identifying data relationships, normalizing data, and creating a database schema called?

- ☐ Querying of Database
- ☐ Programming
- ☐ Optimization of Database
- ☐ Database Design

Which software program facilitates the creation, management, and access of databases?

- ☐ Word processor
- ☐ Web browser
- ☐ Database management system (DBMS)
- ☐ Operating system

Which of the following statements is NOT true about Microsoft Access?

- ☐ It is a relational database management system
- ☐ It combines a graphical user interface with a database engine.
- ☐ It is primarily used for enterprise-level applications.
- ☐ It offers various tools for data analysis and reporting.

What is the primary function of a database query?

- ☐ Create new data in the database
- ☐ Modify existing data in the database
- ☐ Delete data from the database
- ☐ Retrieve specific data from the database

## Exercises

- Write an SQL query to select all customers from a table named 'customers'.

**Answer:**

```
select * from customers;
```

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## Review Questions

- What is a database?
- Explain the difference between relational and non-relational databases.
- Describe the steps involved in database design.
- What are the different types of databases?
- What are the advantages of using a database?
- What is the role of a database management system (DBMS)?

## References and Bibliography

- [Access video training](#)
- [What is Microsoft Access? - Database.Guide](#)