YouTube Channel: freeCodeCamp.org

SQL Tutorial - Full Database Course for Beginners

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Índice general

Capítulo 1

Introduction, What is a Database?

1.1. What is SQL?

- SQL is a language used to interact with relational database management systems.
- A relational database management system is basically just a software application to create and manage different databases.

1.2. What is a database?

- Sometimes databases are abbreviated as DB.
- A database is any collection of related information:
  - Phone book.
  - Shoping list.
  - Todo list.
  - Your 5 best friends.
  - Facebook's User base.
- Database can be stored in different ways.
  - On paper.
  - In your mind.
  - On a computer.
  - This PowerPoint.
  - Comments section.

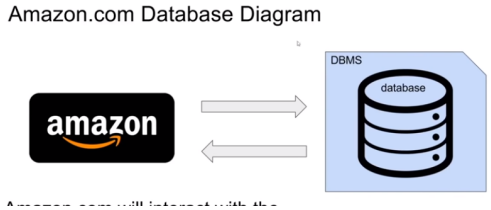
1.3. Computers with databases

- Storing a collection of related information on a computer is extremely useful, computers are great for this.
- A database can be stored anywhere, but there are better ways of storing databases than others. Computers are great at keeping track of large amounts of information.
- Take this example:

Amazon.com	Shopping list
• Keeps track of products, reviews, purchase orders, credit cards, users, media, etc. • Needs to store trillions of pieces of information, and they need to be readily available. • Information is extremely valuable and critical to Amazon.com's functioning. • Security is essential, Amazon stores peoples' personal information: ◦ Credit card #, SSN, Address phone. • Information is stored on a computer.	• Keeps track of customer products that need to be purchased. • Stores 10-20 pieces of information, this also needs to be readily available. • Information is for convenience sake only and not necessary for shopping. • Security is not important. • Information is stored on a piece of paper, or even just in someone's memory.

1.4. Database Management System (DBMS)

- A database can be as simple as a txt file, or excel file, but generally if you need to store large amounts of information a better solution is to use special software designed to create and maintain a database, this is called a Data Management System.
- A special software program that helps users create and maintain a database.
  - Makes it easy to manage large amounts of information.
  - Handles security.
  - Backup your data.
  - Importing and exporting data.
  - Concurrency.
  - Interacts with software applications:
    - Programming software.
- The database management system is not the database it is the software application that is creating, managing, updating, etc the database.



1.5. C.R.U.D

- Create, Read (Retrieve), Update, Delete.
- CRUD represents the 4 main operations that can be done in a database.
- Any good database management systems are able to perform these operations.

1.6. Two types of databases

- Relational Database (SQL): (The most popular kind of database.)
  - Organize data into one or more tables.
  - Each table has columns and rows.
  - A unique key identifies each row.
  - It is a lot like an Excel spreadsheet.
- Non-relational (noSQL / no just SQL):
  - Organize data is anything but a traditional table.
  - Key-value stores.
  - Documents (JSON, XML, etc).
  - Graphs.
  - Flexible tables.
  - Any type of database that is not a non-relational database. Organize data in anything but a table.

1.7. Relational Database (SQL)

Student Table

*ID #	Name	Major
1	Jack	Biology
2	Kate	Sociology
3	Claire	English
4	John	Chemistry

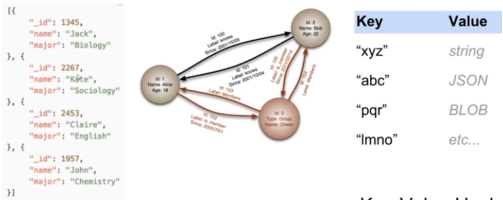
Users Table

*Username	Password	Email
jsmith22	wordpass	...
catlover45	apple223	...
gamerkid	...	...
giraffe	...	...

- Relational Database Management Systems (RDBMS):
  - Help users create and maintain a relational database.
    - mySQL, Oracle, postgreSQL, mariaDB, etc.
- Structured Query Language (SQL):
  - Relational Database Systems use SQL to interact with relational DB.
  - Used to perform CRUD operations, as well as other administrative tasks (user management, security, backups, etc.)
  - Used to define tables and structures.
  - SQL code used on one RDBMS is not always portable to another without modification. Not all SQL code used on one RDBMS will be able to be used on others.

1.8. Non-relational databases

- Anything that is not relational.
- For example:



- Store data on graphs, nodes, key value hash, documents (JSON, BLOB, XML).

- Non-relational Database management systems (NRDBMS):
  - Help users create and maintain a non-relational database.
    - mongoDB, dynamoDB, apache cassandra, firebase, etc.
  - Implementation specific:
    - Unlike RDMBS where there is a standard (SQL), this is implementation specific, there is no standard language for interacting with the non-relational database.
    - Each implementation will include the implementation for managing the database and performing the CRUD operations.
    - Most NRDBMS will implement their own language for performing CRUD operations and administrative operations on the database.

1.9. Database Queries

- Queries are request made to the database management system for specific information:
  - Query is asking the DBMS for information.
- As the database's structure becomes more and more complex it becomes more difficult to get the specific pieces of information we want.
- A Google search is a query.
  - With a relational database management system we cannot search for information in the same way google searches for it, we must adhere to a specific language in this case SQL.

1.10. Wrap up

- Database is any collection of related information.
- Computers are great for storing databases.
- Database Management Systems (DBMS) make it easy to create, maintain and secure a database.
- DBMS allow you to perform the CRUD operations and other administrative tasks.
- Two types of databases, relational and non-relational.
- Relational databases use SQL and store data in tables with rows and columns.
- Non-relational databases store data using other data structures.
- Queries are request made to the database management system for specific information.

Capítulo 2

Tables & Keys