We should all know what SQL is by now: a Structured Query Language for manipulating databases, whether it be creating and manipulating the database, modifying and querying individual elements, or even defining permissions. While we haven’t worked with SQL too much aside from the final project, it is going to be a very important part of our careers as data wranglers in the future. Thus, it is important to know how it and its commands are used. SQL commands can be divided into four different categories based on what they accomplish; this will help in remembering the commands. I will be discussing these categories, as well as the pros and cons of SQL itself.

SQL’s command categories are the Data Definition, Manipulation, Query, and Control Languages:

1. **Data Definition Language:** These are commands for the creation and modification of databases and their elements. They include CREATE for database and element creation, DROP for element removal, ALTER to change a database’s structure, COMMENT to add comments, and RENAME to rename a database or object. The following example creates a table called Test with three integer columns called A, B, and C:

CREATE TABLE Test VALUES(A INTEGER, B INTEGER, C INTEGER)

1. **Data Manipulation Language:** These are three commands for changing the data within an existing database. They are self-explanatory: INSERT for inserting new data into a table, UPDATE for updating existing data, and DELETE for deleting data. The following example inserts the Data tuple into the Test table:

Data = (1, 2, 3)

INSERT INTO Test VALUES(?, ?, ?)

1. **Data Query Language:** These are commands for performing search queries to pull back data, similar to API requests. They usually follow the below format to select data from a database. An asterisk can be used in place of the desired data to pull the entire table.

SELECT (desired data) FROM (desired table)

1. **Data Control Language:** These commands allow for database security by defining or revoking permissions. GRANT will grant a user access privileges to a database, and REVOKE will revoke these privileges.

As these commands show, SQL is a highly versatile language that is very easy to pick up and use. However, there are situations where it is not always optimal. Here are some of the advantages and disadvantages of using SQL:

**Advantages:**

Fast Processing: The aforementioned commands can be executed very quickly, often in a few seconds.

Universal: SQL is not only easy to use, but the data format is standardized worldwide and can be used regardless of the installed OS and specifications.

User-friendly: The commands are so easy to pick up that using SQL mirrors using Microsoft Excel.

**Disadvantages:**

Database Format: Sometimes it can be difficult converting between an SQL database and a dataframe object that can be used in the program.

Data Control: This feature of SQL often ends up being a disadvantage. Often, database permissions are severely limited when proprietary data is stored within.

Interface: While SQL is very easy to use, its interface is not as clean as Microsoft Excel, which may be off-putting to many who are unfamiliar with it.

It is clear, though, that the pros of SQL outweigh the cons, making it the database language of choice for many.

References:

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