

SQL LECTURE

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Programming With Us

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LECTURE BREAKDOWN

- What is a Database? Why do we need one?
- What are the major SQL based software out there?
- Basic SQL Commands
- Set up SQLite3

WHAT'S A DATABASE? WHY DO WE NEED IT?

- Information can be stored in many different ways. Text documents, physical documents, spreadsheets. So why use SQL?
- Database is designed to store information by virtue of allowing:
 - Easy Look up of information
 - Efficient storage of large amounts of information
 - Create a relationships between different sets of data

SQL – STRUCTURE QUERY LANGUAGE

- SQL (Structure Query Language) is a programming language that allows you to interact with a SQL-based database. The word “query” is used to emphasize the ability to ask (search) for specific data.
- SQL Software Available:
 - PostgreSQL, MySQL, SQL Server, SQLite3, etc.
- Other Database Software:
 - Oracle, MongoDB, Hadoop, etc.

STUDENT DATABASE

student_login TABLE

- ID **primary key** (Integer)
- Username (String)
- Password (String)

student_info TABLE

- ID **primary key** (Integer)
- Student_id **foreign key** (Integer)
- Email (String)
- Address (String)
 - City (String)
- Birthdate (Date)



BASIC SQL COMMANDS

- **SELECT** – Return what follows the word **SELECT** .
 - i.e. `SELECT job, salary FROM employee_table;`
- **UPDATE** – Change the value in a column (can be used with a **WHERE** clause)
 - i.e. `UPDATE employee_table SET salary = 100000 WHERE employee_name = "Tom";`
- **INSERT** – Create/Insert a row into a table.
 - `INSERT INTO employee_table (employee_name, job, salary) VALUES ("Sandra", "Managing Director", 120000);`
- **DELETE** – remove rows that contain a certain condition
 - `DELETE FROM employee_table WHERE job = "Consultants";`

WHERE CLAUSE

- WHERE clause allows you to specify a condition that needs to be met by a row in the stated table.
- WHERE is follows by the following language:
 - WHERE `column_name = "some_string"`
 - WHERE `column_name (>=,<=, =) some_number`
 - WHERE `column_name LIKE "%nana"`
 - i.e. `SELECT * from fruit_table WHERE name LIKE "%nana"`

SQL COMMAND EXAMPLE

- To begin to create your own queries, it is important to sound out what you are asking for.
- For example, “Give me all the people who are named David”
- This would translate to:
 - `SELECT * FROM people_table WHERE name = “David”;`
- Depending on what language you use, there may be different syntax (set of words and combinations) that are allow for the above result.

SQLITE3

- SQLite3 is a database software that allows you to create databases as mentioned above.
 - It has modules/libraries for most languages, including Python
- In a professional environment, people will most likely not be using SQLite3, but it is a good learning tool.

SETTING UP SQL

Lets go to the code!

TO SUMMARIZE:

- MySQL or PostgreSQL or SQL Server are nothing more than programs that allows people to store and look up information in a database.
- SQL is a language that allows you to interact with the above program to create, read, and store data.