Intro to SQL

SQL Workshop w/Prof Loren

What is SQL?

- SQL stands for Structured Query Language
- SQL lets you access and manipulate databases
- SQL is also a relational database
- SQL can also allow the following actions against the database:
  - Execute queries
  - Retrieve data
  - Insert records
  - Delete records
  - Update records
  - Create new tables
  - And many more

Important SQL Commands

- CREATE DATABASE
- ALTER DATABASE
- CREATE TABLE
- ALTER TABLE
- SELECT
- UPDATE
- DELETE
- INSERT INTO
- CREATE INDEX
- DROP INDEX

SQL Data Types

- Some of the more common data types:
  - Char(n)
  - Varchar(n)
  - Bit
  - Int
  - Bigint
  - Decimal(p,s)
  - Float(n)
  - Date
  - Time

Create Database

- The CREATE DATABASE statement is used to create a database.
  - CREATE DATABASE *dbname*
- The following SQL statement creates a database called “my_db”
  - CREATE DATABASE my_db;

Exercise 1

- Create a database called “SQL_Workshop”

Create Table

- The CREATE TABLE statement is used to create a table in a database
- Tables are organized into rows and columns; each table must have a name
- The column_name parameter specifies the name of the column
- The data_type parameter specifies what type of data the column can hold
- The size parameter specifies the maximum length of the column
- CREATE TABLE Syntax:

```
CREATE TABLE table_name
(
column_name1 data_type(size),
column_name2 data_type(size),
column_name3 data_type(size),
....
);
```

Tables

- Tables contain records (rows) with data.
- The table to the right contains five records (one for each customer) and six columns describing the customer
- A database most often contains one or more tables
- Each table is identified by a name(e.g. “Customers” or “Orders”)

CustomerID	CustomerName	ContactName	Address	City	PostalCode
1	Alfreds Futterkiste	Maria Anders	Obere Str. 57	Berlin	12209
2	Ana Trujillo Emparedados y helados	Ana Trujillo	Avda. de la Constitución 2222	México D.F.	05021
3	Antonio Moreno Taquería	Antonio Moreno	Mataderos 2312	México D.F.	05023
4	Around the Horn	Thomas Hardy	120 Hanover Sq.	London	WA1 1DP
5	Berglunds snabbköp	Christina Berglund	Berguvsvägen 8	Luleå	S-958 22

SQL Select

- The SELECT statement is used to select data from a table in a database
- The result is stored in result table, called the result-set
- Syntax:

```
SELECT column_name,column_name
FROM table_name;
```

- And

```
SELECT * FROM table_name;
```

- Run a select statement on Customers table to view the data in table

Exercise 2

- Create table named “Customers”
- Table should have the following column names and datatypes
  - CustomerId – INT
  - CustomerName – VARCHAR(100)
  - Address – VARCHAR(100)
  - City – VARCHAR(50)
  - ZipCode – VARCHAR(5)

SQL Insert Into

- The INSERT INTO statement is used to insert new records in a table
- It is possible to write the INSERT INTO statement in two forms
  - The first form does not specify the column names where the data will be inserted, only their values

```
INSERT INTO table_name
VALUES (value1,value2,value3,...);
```

  - The second form specifies both the column names and values to be inserted

```
INSERT INTO table_name (column1,column2,column3,...)
VALUES (value1,value2,value3,...);
```

  - EX:

```
INSERT INTO Customers (CustomerName, ContactName, Address, City, PostalCode, Country)
VALUES ('Cardinal','Tom B. Erichsen','Skagen 21','Stavanger','4006','Norway');
```

Exercise 3

- Insert 5 records into customers table
  - 2 records with City = “Chicago”
  - 3 records with City = “New York”

SELECT DISTINCT and WHERE Clause

- The SELECT DISTINCT statement is used to return only distinct (different) values
- In a table, a column may contain many duplicate values; sometimes you only want to list the different (distinct) values

```
SELECT DISTINCT column_name,column_name
FROM table_name;
```

- The WHERE clause is used to filter records
- Used to extract only those records that fulfill a specified criteria

```
SELECT column_name,column_name
FROM table_name
WHERE column_name operator value;
```

```
SELECT DISTINCT * FROM Customers
WHERE City = 'New York';
```

Exercise 4

- Search the table for only those who live in Chicago
- How many distinct zip codes are there?

SQL Update

- The UPDATE statement is used to update existing records in a table
- SQL UPDATE Syntax:

```
UPDATE table_name
SET column1=value1,column2=value2,...
WHERE some_column=some_value;
```

  - The WHERE statement specifies which record or records that should be updated. If you omit the WHERE clause, all records will be updated.
- Warning!
  - Be careful when updating records. If WHERE clause is omitted than all records in table will be affected.

Exercise 5

- Update all records with City = “Chicago
  - Set the zipcode to “60605”
- Update all records with City = “New York”
  - Set the zipcode to “?????”

SQL DELETE

- The DELETE statement is used to delete rows in a table
- SQL DELETE Syntax:

```
DELETE FROM table_name
WHERE some_column=some_value;
```

  - The WHERE clause specifies which record or records that should be deleted.

Exercise 6

- Delete all records from Customers table where the City = “Chicago”
  - Should delete 2 records from Customers table

SQL ORDER BY Keyword

- The ORDER BY keyword is used to sort the result-set by one or more columns
- The ORDER BY keyword sorts the records in ascending order by default. To sort the records in descending order, you can use the DESC keyword.

```
SELECT column_name, column_name
FROM table_name
ORDER BY column_name ASC|DESC, column_name ASC|DESC;
```

```
SELECT * FROM Customers
ORDER BY CustomerName;
```

Exercise 7

- ORDER BY:
  - customerid ascending
  - customerid descending

Notice a difference?

Thanks for learning SQL with me!

Hope you enjoyed a taste of being a data bender!

Any questions?

Feel free to reach out: lm.velasquez12@gmail.com
or tweet me at @rebeldroid12

- Prof Loren