Chapter 1 : SQL Basics

Aviral Janveja

1 Introduction

SQL is the standard language for storing, manipulating and retrieving data from databases. The concepts learned here can be applied on real world databases from **mode.com**.

1.1 SQL

Structured **Q**uery **L**anguage is a programming language designed for managing data in a relational database. Most of the actions you need to perform on a database are done with SQL queries. SQL queries consists of keywords that are easy to understand. For instance, the following query returns all records from a table named tutorial.us_housing_units.

```
SELECT *
    FROM tutorial.us_housing_units:
```

1.2 Database

A database is an organized collection of data. There are many ways to organize a database and many different types of databases designed for different purposes.

If you've used Excel, you should already be familiar with tables. Database Tables have rows and columns just like Excel, but are a little more rigid. For instance, they are always organized by column and each column must have a unique name. To get a sense of this organization, the image below shows a sample database table.

year	category	nominee	movie	winner
2010	actress in a leading role	Nicole Kidman	Rabbit Hole	false
2010	actress in a leading role	Jennifer Lawrence	Winter's Bone	false
2010	actress in a leading role	Michelle Williams	Blue Valentine	false
2010	actress in a leading role	Natalie Portman	Black Swan	true
2010	actress in a leading role	Annette Bening	The Kids Are All Right	false
2010	actor in a leading role	Jesse Eisenberg	The Social Network	false
2010	actor in a leading role	Colin Firth	The King's Speech	true
2010	actor in a leading role	James Franco	127 Hours	false
2010	actor in a leading role	Javier Bardem	Biutiful	false
2010	actor in a leading role	Jeff Bridges	True Grit	false

Figure 1: Example Table

2 SELECT

Let us start by looking at some basic SQL syntax and queries. There are two required ingredients in any SQL query : **SELECT** and **FROM** and they have to be in that order. SELECT indicates which columns you would like to view, and FROM identifies the table that they live in.

```
SELECT year,
       month,
       west
    FROM tutorial.us_housing_units
```

So what's happening in the above query? The query is telling the database to return the year, month, and west columns from the table tutorial.us_housing_units.

2.1 Formatting Conventions

You might have noticed that the SELECT and FROM commands are capitalized. This isn't actually necessary. SQL will understand these commands if you type them in lowercase. Capitalizing commands is simply a convention that makes queries easier to read. Similarly, SQL treats one space, multiple spaces, or a line break as being the same thing.

2.2 Column Names

While we're on the topic of formatting, it's worth noting the format of column names. All of the columns in the tutorial.us_housing_units table are named in lower case, and use underscores instead of spaces. The table name itself also uses underscores instead of spaces.

If you want to have spaces in column names, you need to always refer to those columns in double quotes. For example, if you want the "west" column to appear as "West Region" in the results, you would have to type:

```
SELECT west AS "West Region"
    FROM tutorial.us_housing_units
```

3 LIMIT