Hands-on Lab : Basics of SQL SELECT Statement

Estimated time needed: 20 minutes

In this lab, you will learn one of the most commonly used statements of SQL (Structured Query Language), the SELECT statement. The SELECT statement is used to select data from a database.

How does the syntax of a SELECT statement look?

```
SELECT column1, column2, ...
FROM table_name
WHERE condition
;
```

What do the keywords / clauses of a SQL statement shown above do?

- **FROM**: Specifies from which table to get the data. The clause can include optional JOIN subclauses to specify the rules for joining tables.
- [Optional Clause] **WHERE** : Specifies which rows to retrieve.

Why is there a semicolon after the SQL statements?

- Some database systems require a semicolon at the end of each SQL statement for execution. It is a standard way to separate one SQL statement from another which allows more than one SQL statement to be executed in the same call to the server. So, it is good practice to use a semicolon at the end of each SQL statement.

Software Used in this Lab

In this lab, you will use Datasette , an open source multi-tool for exploring and publishing data.

Database Used in this Lab

The database used in this lab comes from the following dataset source: Film Locations in San Francisco under a PDDL: Public Domain Dedication and License.

Objectives

After completing this lab, you will be able to:

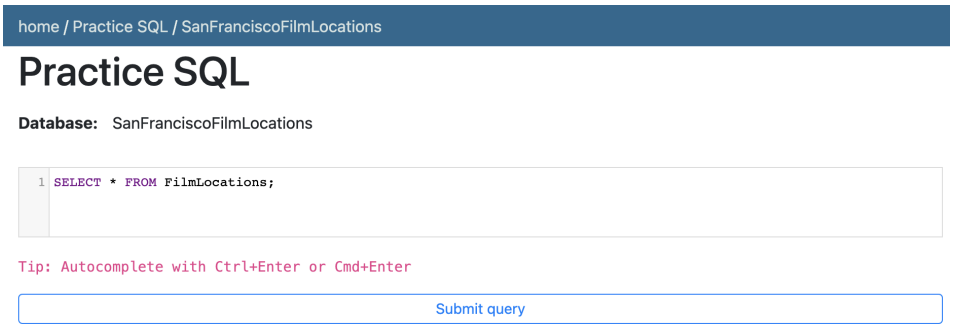
- Query a database
- Retrieve data records from one or more tables of a database as resultset according to the criteria you specify

Task A: Exploring the Database

Let us first explore the **SanFranciscoFilmLocations** database using the **Datasette** tool:

1. If the first statement listed below is not already in the Datasette textbox on the right, then copy the code below by clicking on the little copy button on the bottom right of the codeblock below and then paste it into the textbox of the Datasette tool using either **Ctrl+V** or right-click in the text box and choose **Paste**.

   ```
   SELECT * FROM FilmLocations;
   ```

2. Click **Submit Query**.

3. Now you can scroll down the table and explore all the columns and rows of the **FilmLocations** table to get an overall idea of the table contents.

Title	ReleaseYear	Locations	FunFacts	ProductionCompany	Distributor	Director	Writer	Actor1	Actor2	Actor3
180	2011	Epic Roasthouse (399 Embarcadero)		SPI Cinemas		Jayendra	Umarji Anuradha, Jayendra, Aarthi Sriram, & Suba	Siddarth	Nithya Menon	Priya Anand
180	2011	Mason & California Streets (Nob Hill)		SPI Cinemas		Jayendra	Umarji Anuradha, Jayendra, Aarthi Sriram, & Suba	Siddarth	Nithya Menon	Priya Anand
180	2011	Justin Herman Plaza		SPI Cinemas		Jayendra	Umarji Anuradha, Jayendra, Aarthi Sriram, & Suba	Siddarth	Nithya Menon	Priya Anand
180	2011	200 block Market Street		SPI Cinemas		Jayendra	Umarji Anuradha, Jayendra, Aarthi Sriram, & Suba	Siddarth	Nithya Menon	Priya Anand
180	2011	City Hall		SPI Cinemas		Jayendra	Umarji Anuradha, Jayendra, Aarthi Sriram, & Suba	Siddarth	Nithya Menon	Priya Anand
180	2011	Polk & Larkin Streets		SPI Cinemas		Jayendra	Umarji Anuradha, Jayendra, Aarthi Sriram, & Suba	Siddarth	Nithya Menon	Priya Anand
180	2011	Randall Museum		SPI Cinemas		Jayendra	Umarji Anuradha, Jayendra, Aarthi Sriram, & Suba	Siddarth	Nithya Menon	Priya Anand

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4. These are the column attribute descriptions from the **FilmLocations** table:

```
FilmLocations(
    Title:              titles of the films,
    ReleaseYear:        time of public release of the films,
    Locations:          locations of San Francisco where the films were shot,
    FunFacts:           funny facts about the filming locations,
    ProductionCompany:  companies who produced the films,
    Distributor:        companies who distributed the films,
    Director:           people who directed the films,
    Writer:             people who wrote the films,
    Actor1:             person 1 who acted in the films,
    Actor2:             person 2 who acted in the films,
    Actor3:             person 3 who acted in the films
)
```

Task B: Example exercises on SELECT statement

Now let us go through some examples of SELECT queries:

1. In this example, suppose we want to retrieve details of all the films from the "FilmLocations" table. The details of each film record should contain all the film columns.

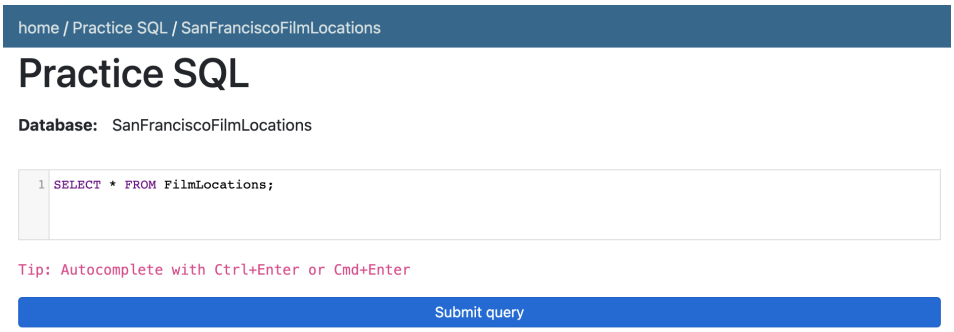
    1. Problem:

        Retrieve all records with all columns from the "FilmLocations" table.

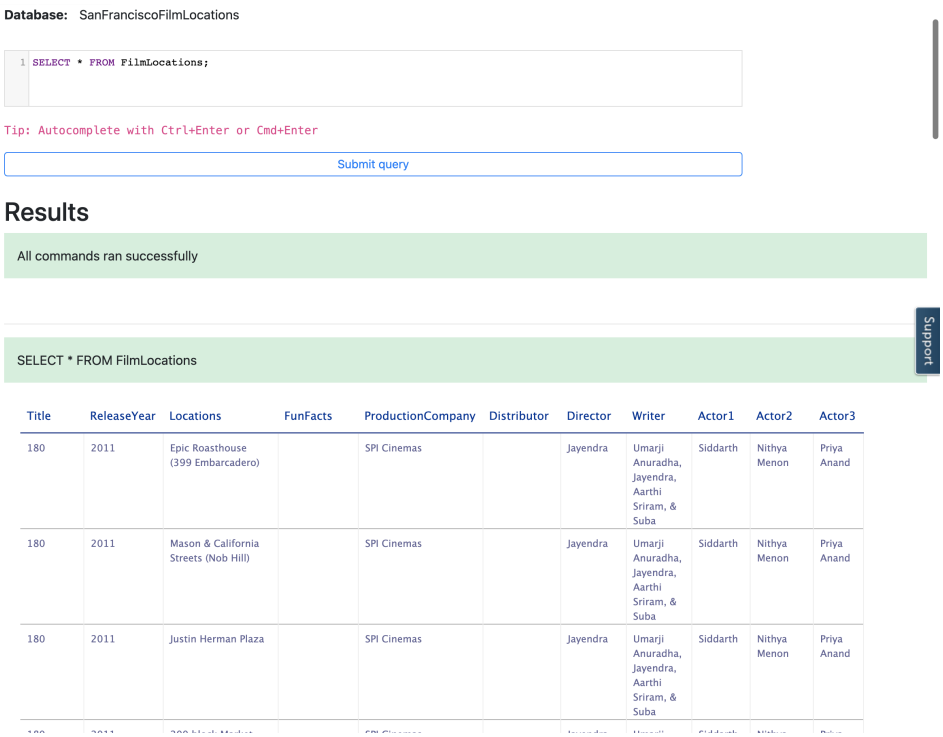
    2. Solution:

```
SELECT * FROM FilmLocations;
```

3. Copy the solution code above by clicking on the little copy button on the bottom right of the codeblock below and paste it to the textbox of the Datasette tool. Then click **Submit query**.



4. Your output resultset should match like below:



2. In this example, now we want to retrieve selective details of all the film records. Let us retrieve the names of all the films along with director names and writer names.

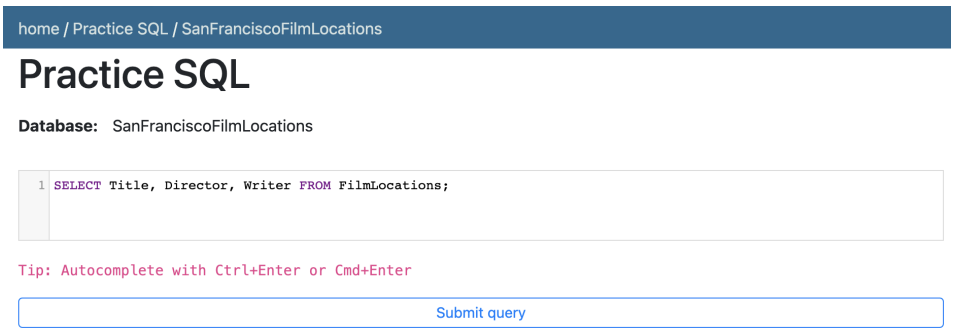
    1. Problem:

        Retrieve the names of all films with director names and writer names.

    2. Solution:

```
SELECT Title, Director, Writer FROM FilmLocations;
```

    3. Copy the solution code above by clicking on the little copy button on the bottom right of the codeblock below and paste it to the textbox of the Datasette tool. Then click **Submit query**.



4. Your output resultset should match like below:

3. In this example, we want to retrieve film names along with filming locations and release years. But we also want to restrict the output resultset so that we can retrieve only the film records released in 2001 and onwards (release years after 2001 including 2001).

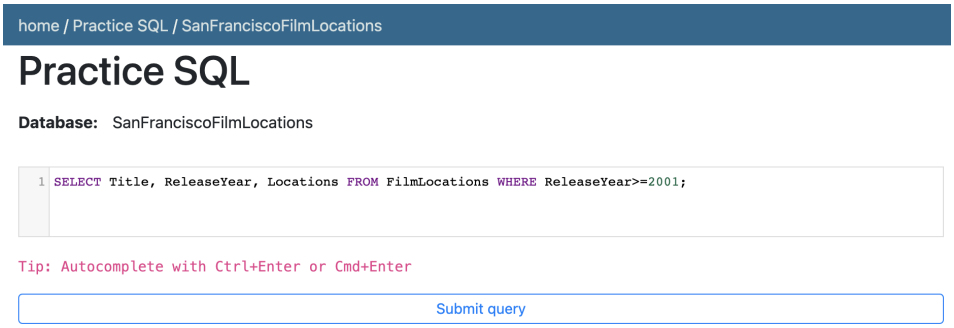
    1. Problem:

        Retrieve the names of all films released in the 21st century and onwards (release years after 2001 including 2001), along with filming locations and release years.

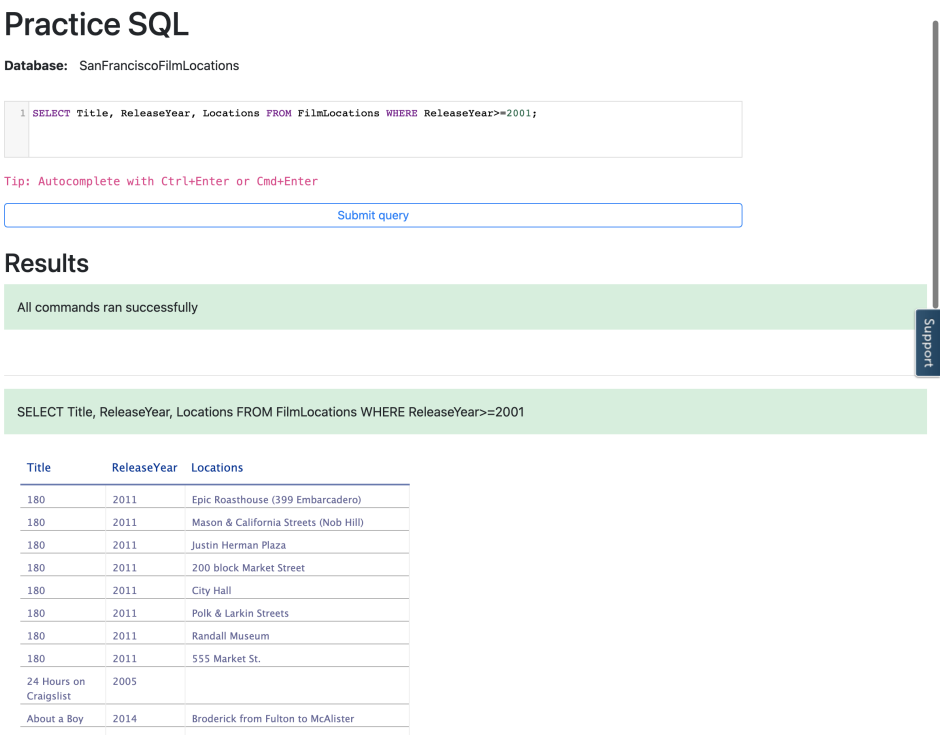
    2. Solution:

```
SELECT Title, ReleaseYear, Locations FROM FilmLocations WHERE ReleaseYear>=2001;
```

    3. Copy the solution code above by clicking on the little copy button on the bottom right of the codeblock below and paste it to the textbox of the Datasette tool. Then click **Submit query**.



4. Your output resultset should match like below:



Task C: Practice exercises on SELECT statement

Finally, let us practice creating and running some SELECT queries.

1. Problem:

   Retrieve the fun facts and filming locations of all films.

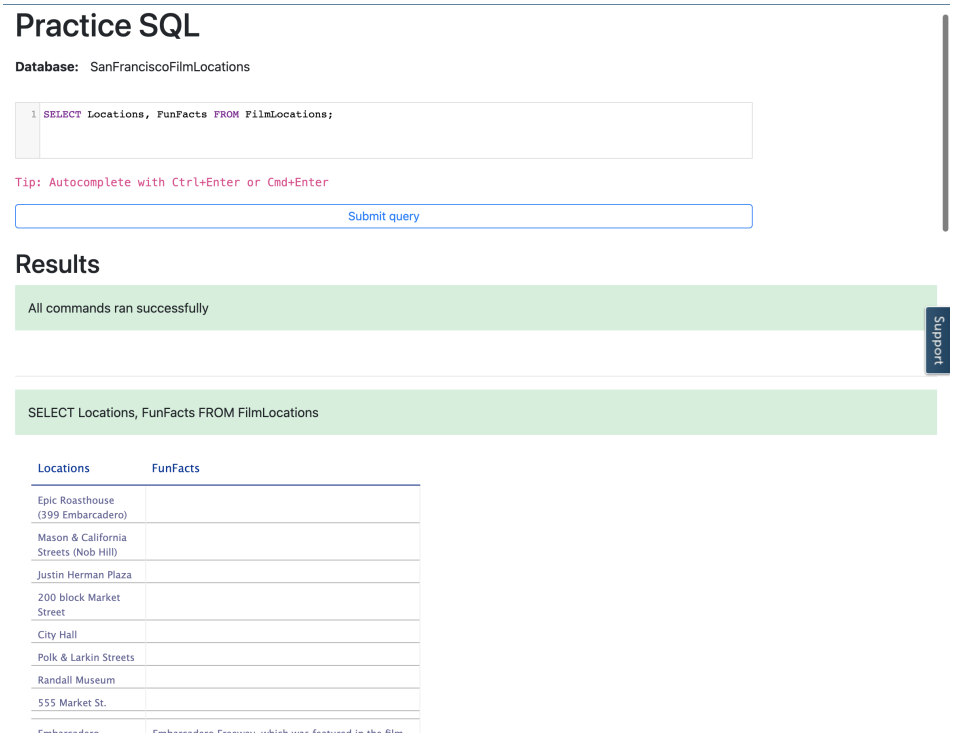
▼ Click here for Hint

Follow example 2 of SELECT where records have been retrieved containing details of some particular columns.

▼ Click here for Solution

```
SELECT Locations, FunFacts FROM FilmLocations;
```

▼ Click here for Output



2. Problem:

> *Retrieve the names of all films released in the 20th century and before (release years before 2000 including 2000) that, along with filming locations and release years.*

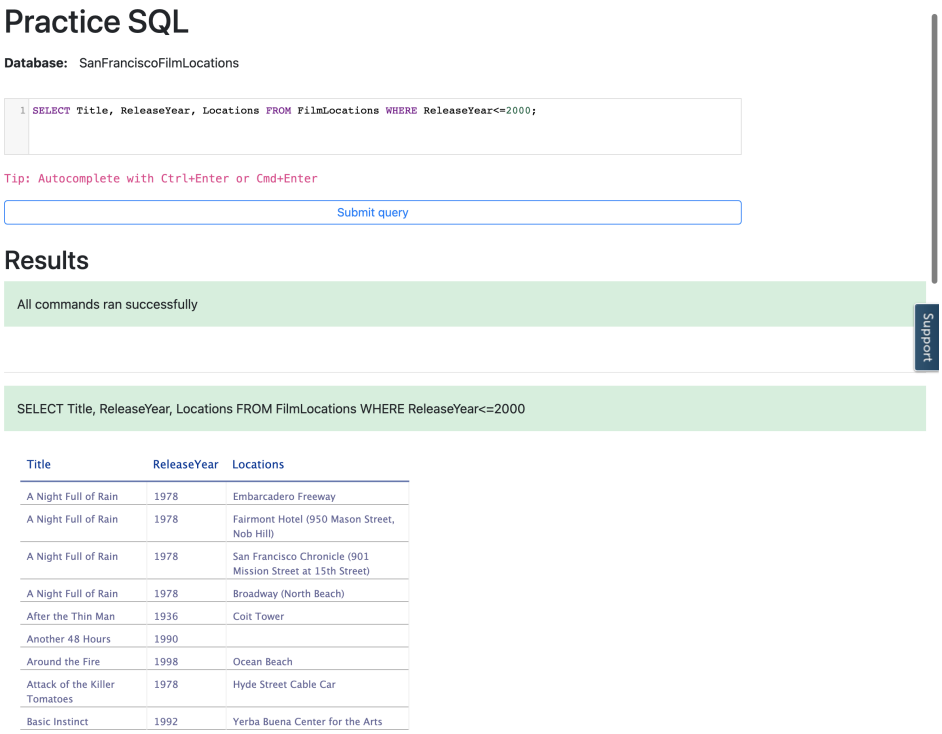
▼ Click here for Hint

> Follow example 3 of SELECT where we restricted the output resultset so that we can retrieve only the film records with certain release years. Use WHERE clause comparsion operator <= which means **"Less than or equal to"**.

▼ Click here for Solution

```
SELECT Title, ReleaseYear, Locations FROM FilmLocations WHERE ReleaseYear<=2000;
```

▼ Click here for Output



Practice SQL

Database: SanFranciscoFilmLocations

```
SELECT Title, ReleaseYear, Locations FROM FilmLocations WHERE ReleaseYear<=2000;
```

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

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SELECT Title, ReleaseYear, Locations FROM FilmLocations WHERE ReleaseYear<=2000

Title	ReleaseYear	Locations
A Night Full of Rain	1978	Embarcadero Freeway
A Night Full of Rain	1978	Fairmont Hotel (950 Mason Street, Nob Hill)
A Night Full of Rain	1978	San Francisco Chronicle (901 Mission Street at 15th Street)
A Night Full of Rain	1978	Broadway (North Beach)
After the Thin Man	1936	Coit Tower
Another 48 Hours	1990	
Around the Fire	1998	Ocean Beach
Attack of the Killer Tomatoes	1978	Hyde Street Cable Car
Basic Instinct	1992	Yerba Buena Center for the Arts

3. Problem:

   Retrieve the names, production company names, filming locations, and release years of the films which are not written by James Cameron.

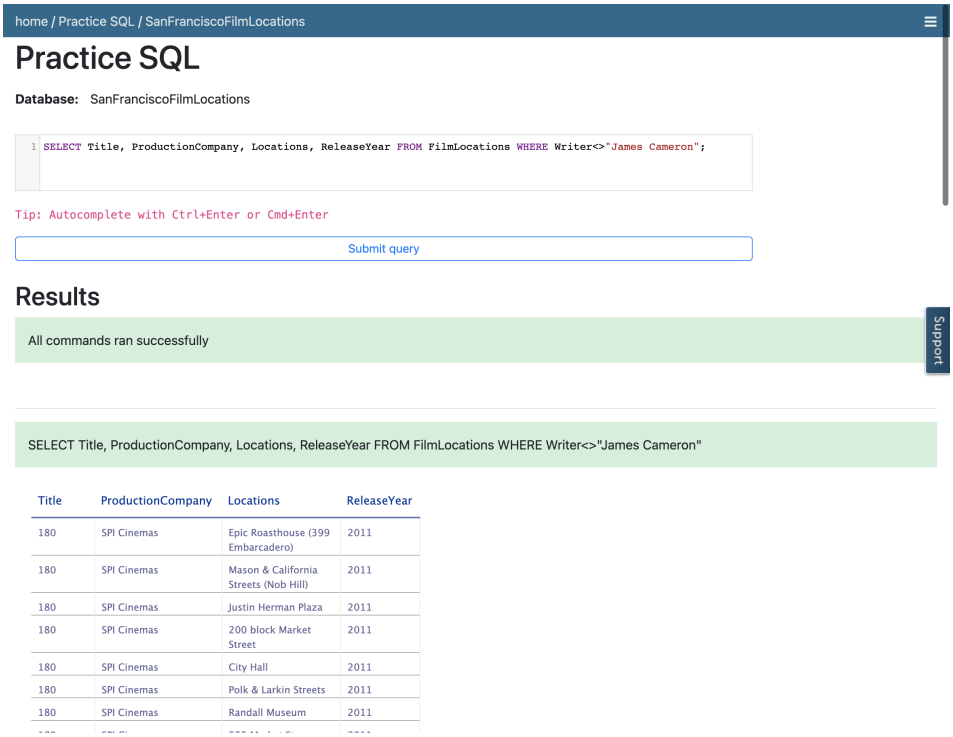
▼ Click here for Hint

Use WHERE clause comparsion operator <> which means **"Not equal to"**.

▼ Click here for Solution

```
SELECT Title, ProductionCompany, Locations, ReleaseYear FROM FilmLocations WHERE Writer<>"James Cameron";
```

▼ Click here for Output



Congratulations! You have completed this Lab.

Author(s)

- Sandip Saha Joy

Other Contributor(s)

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Changelog

Date	Version	Changed by	Change Description
2020-11-23	1.1	Steve Ryan	ID Review
2020-11-20	1.0	Sandip Saha Joy	Initial version created

Previous