

Hands-on Lab: COUNT, DISTINCT, LIMIT



Estimated time needed: 30 minutes

In this lab, you will learn a few useful expressions that are used with SELECT statements. First, you will learn COUNT, which is an aggregate function that retrieves the number of rows that matches the query criteria. Next, you will learn DISTINCT, which is used to remove duplicate values from a specified result set and only return the unique values. Lastly, you will learn LIMIT, which is used for restricting the number of rows retrieved from the table.

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 data set source: [Film Locations in San Francisco](#) under a [PDDL: Public Domain Dedication and License](#).

Objectives

After completing this lab, you will be able to:

- Retrieve the number of rows that match a query criteria
- Remove duplicate values from a result set and return the unique values
- Restrict the number of rows retrieved from a table

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 the little copy button on the bottom right of the code block 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;
```

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Practice SQL

Database: SanFranciscoFilmLocations

1 SELECT * FROM FilmLocations;

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

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.

Title	ReleaseYear	Locations	FunFacts	ProductionCompany	Distributor	Director	Writer	Actor1	Actor2	Actor3
180	2011	Epit Razzhouse (300 Embarcadero)		SP Cinemas		Jayendra	Umargi Anuraadha, Jayendra, Aarthi Sriam, & Sudh	Siddarth	Nithya Menon	Priya Anand
180	2011	Mason & California Streets (Dead Hill)		SP Cinemas		Jayendra	Umargi Anuraadha, Jayendra, Aarthi Sriam, & Sudh	Siddarth	Nithya Menon	Priya Anand
180	2011	Justin Herman Plaza		SP Cinemas		Jayendra	Umargi Anuraadha, Jayendra, Aarthi Sriam, & Sudh	Siddarth	Nithya Menon	Priya Anand
180	2011	200 Black Market Street		SP Cinemas		Jayendra	Umargi Anuraadha, Jayendra, Aarthi Sriam, & Sudh	Siddarth	Nithya Menon	Priya Anand
180	2011	City Hall		SP Cinemas		Jayendra	Umargi Anuraadha, Jayendra, Aarthi Sriam, & Sudh	Siddarth	Nithya Menon	Priya Anand
180	2011	Pink & Larkin Streets		SP Cinemas		Jayendra	Umargi Anuraadha, Jayendra, Aarthi Sriam, & Sudh	Siddarth	Nithya Menon	Priya Anand
180	2011	Randall Museum		SP Cinemas		Jayendra	Umargi Anuraadha, Jayendra, Aarthi Sriam, & Sudh	Siddarth	Nithya Menon	Priya Anand
180	2011	555 Market St.		SP Cinemas		Jayendra	Umargi Anuraadha, Jayendra, Aarthi Sriam, & Sudh	Siddarth	Nithya Menon	Priya Anand

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
)
```

Using COUNT statement

Let us go through some examples of COUNT-related queries.

1. Suppose we want to count the number of records or rows of the "FilmLocations" table. The query for this would be:

```
SELECT COUNT(*) FROM FilmLocations;
```

Copy the code above and paste it to the query box of the Datasette tool. Then click **Submit query**. Your output result set should look like the image below:

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Practice SQL

Database: SanFranciscoFilmLocations

SELECT COUNT(*) FROM FilmLocations;

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

SELECT COUNT(*) FROM FilmLocations

COUNT(*)
3414

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2. We want to count the number of locations of the films. But we also want to restrict the output result set so that we only retrieve the number of locations of the films written by a certain writer. The query for this can be written as:

```
SELECT COUNT(Locations) FROM FilmLocations WHERE Writer="James Cameron";
```

Copy the code above and paste it to the textbox of the Datasette tool. Then click **Submit query**.

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Practice SQL

Database: SanFranciscoFilmLocations

SELECT COUNT(Locations) FROM FilmLocations WHERE Writer="James Cameron";

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

SELECT COUNT(Locations) FROM FilmLocations WHERE Writer="James Cameron"

COUNT(Locations)
48

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Using DISTINCT statement

In this exercise, you will go through some examples of using DISTINCT in queries.

1. Assume that we want to retrieve the titles of all films in the table so that duplicates will be discarded in the output result set.

```
SELECT DISTINCT Title FROM FilmLocations;
```

Copy the code above and paste it to the textbox of the Datasette tool. Then click **Submit query**.

Your output resultset should look like the image below:

Practice SQL

Database: SanFranciscoFilmLocations

SELECT DISTINCT Title FROM FilmLocations;

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

SELECT DISTINCT Title FROM FilmLocations

Title
180
24 Hours in Congress
A Night Full of Rain
About a Boy
Age of Adaline
After the Thin Man
Amélie
Americana
Another 48 Hours
Around the Fire
Attack of the Killer Tomatoes

2. We want to retrieve the count of release years of the films produced by a specific company so that duplicate release years of those films will be discarded in the count.

```
SELECT COUNT(DISTINCT ReleaseYear) FROM FilmLocations WHERE ProductionCompany="Warner Bros. Pictures";
```

Copy the code above and paste it to the textbox of the Datasette tool. Then click **Submit query**.

Your output resultset should look like the image below:

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Practice SQL

Database: SanFranciscoFilmLocations

```
1 SELECT COUNT(DISTINCT ReleaseYear) FROM FilmLocations WHERE ProductionCompany="Warner Bros. Pictures";
```

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

SELECT COUNT(DISTINCT ReleaseYear) FROM FilmLocations WHERE ProductionCompany="Warner Bros. Pictures"

COUNT(DISTINCT ReleaseYear)

14

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Using LIMIT statement

In this exercise, you will first go through some examples of using LIMIT in queries.

1. Retrieve only the first 25 rows from the table so that rows other than those are not in the output result set.

```
SELECT * FROM FilmLocations LIMIT 25;
```

Copy the code above and paste it to the textbox of the Datasette tool. Then click **Submit query**.

Your output resultset should look like the image below:

Practice SQL

Database: SanFranciscoFilmLocations

```
1 SELECT * FROM FilmLocations LIMIT 25;
```

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

SELECT * FROM FilmLocations LIMIT 25

Title	ReleaseYear	Locations	FunFacts	ProductionCompany	Distributor	Director	Writer	Actor1	Actor2	Actor3
180	2011	Epit Roadhouse (399 Embarcadero)		SPI Cinemas		Jayendra	Umagi Anuradha, Jayendra, Aarthi Srinani, & Saba	Siddarth Nitheya Menon	Prithi Arund	
180	2011	Mason & California Street (Near 18th)		SPI Cinemas		Jayendra	Umagi Anuradha, Jayendra, Aarthi Srinani, & Saba	Siddarth Nitheya Menon	Prithi Arund	
180	2011	Justin Herman Plaza		SPI Cinemas		Jayendra	Umagi Anuradha, Jayendra, Aarthi Srinani, & Saba	Siddarth Nitheya Menon	Prithi Arund	

2. Now, we want to retrieve 15 rows from the table starting from row 11.

```
SELECT * FROM FilmLocations LIMIT 15 OFFSET 10;
```

Copy the code above and paste it to the textbox of the Datasette tool. Then click **Submit query**.

Your output resultset should look like the image below:

Practice SQL

Database: SanFranciscoFilmLocations

```
1 SELECT * FROM FilmLocations LIMIT 15 OFFSET 10;
```

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

SELECT * FROM FilmLocations LIMIT 15 OFFSET 10

Title	ReleaseYear	Locations	FunFacts	ProductionCompany	Distributor	Director	Writer	Actor1	Actor2	Actor3
A Night Full of Rain	1978	Fairmont Hotel (225 Mason Street, Nob Hill)	In 1945 the Fairmont hosted the United Nations Conference on International Organization as delegates arrived to draft a charter for the organization. The U.S. Government of	Liberty Film	Warner Bros. Pictures	Lina Wertmuller	Lina Wertmuller	Candice Bergen	Giancarlo Giannini	

Practice exercises

COUNT

1. Retrieve the number of locations of the films which are directed by Woody Allen.

▼ Hint

Follow example 2 of the COUNT exercise. Use the WHERE clause comparison operator =, which means **Equal to**.

▼ Query Solution

```
SELECT COUNT(Locations) FROM FilmLocations WHERE Director="Woody Allen";
```

▼ Output

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Practice SQL

Database: SanFranciscoFilmLocations

```
1 SELECT COUNT(Locations) FROM FilmLocations WHERE Director="Woody Allen";
```

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

SELECT COUNT(Locations) FROM FilmLocations WHERE Director="Woody Allen"

Count(Locations)

62

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2. Retrieve the number of films shot at Russian Hill.
- ▼ Hint
- Follow example 2 of the COUNT exercise. Use the WHERE clause comparison operator =, which means **Equal to**.
- ▼ Query Solution
- SELECT Count(Title) FROM FilmLocations WHERE Locations="Russian Hill";

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Practice SQL

Database: SanFranciscoFilmLocations

```
1 SELECT Count(Title) FROM FilmLocations WHERE Locations="Russian Hill";
```

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

SELECT Count(Title) FROM FilmLocations WHERE Locations="Russian Hill"

Count(Title)

1

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3. Retrieve the number of rows having a release year older than 1950 from the "FilmLocations" table.
- Hint
- Query Solution
- ▼ Output

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Practice SQL

Database: SanFranciscoFilmLocations

```
1 SELECT Count(*) FROM FilmLocations WHERE ReleaseYear<1950;
```

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

SELECT Count(*) FROM FilmLocations WHERE ReleaseYear<1950

Count(*)

62

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Practice exercises

DISTINCT

1. Retrieve the names of all unique films released in the 21st century and onwards, along with their release years.
- ▼ Hint
- Follow example 1 of DISTINCT. Use WHERE clause comparison operator >=, which means **Greater than or equal to**.
- ▼ Query Solution
- SELECT DISTINCT Title, ReleaseYear FROM FilmLocations WHERE ReleaseYear>=2001;
- ▼ Output

Practice SQL

Database: SanFranciscoFilmLocations

1

SELECT DISTINCT Title, ReleaseYear FROM FilmLocations WHERE ReleaseYear=2001;

Submit query

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Results

All commands ran successfully

SELECT DISTINCT Title, ReleaseYear FROM FilmLocations WHERE ReleaseYear=2001

Title	ReleaseYear
180	2001
24 Hours in Camelot	2005
About a Boy	2004
Age of Adam	2005
Age-Men	2005
Americana	2005
Blue Jasmine	2013
Bus Season	2005
Big City	2014
Big Sur	2013
Summerstone	2015

2. Retrieve the directors' names and their distinct films shot at City Hall.

▼ Hint

Follow example 1 of DISTINCT. Use WHERE clause comparison operator =, which means **Equal to**.

▼ Query Solution

SELECT DISTINCT Title, Director FROM FilmLocations WHERE Locations="City Hall";

▼ Output

Practice SQL

Database: SanFranciscoFilmLocations

1

SELECT DISTINCT Title, Director FROM FilmLocations WHERE Locations="City Hall";

Submit query

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Results

All commands ran successfully

SELECT DISTINCT Title, Director FROM FilmLocations WHERE Locations="City Hall"

Title	Director
180	Jamieia
Bedazzled	Harold Ramis
Bicentennial Man	Chris Columbus
Bliss and Cells	Robert Iscove
Class Action	Michael Apted
Dawn of the Planet of the Apes	Matt Reeves
Final Analysis	Phil Joanes
The Rock	Michael Bay
The Wedding Planner	Adam Shankman
When We Rise	Clay Van Sant
The Right Stuff	Philip Kaufman

3. Retrieve the number of distributors who distributed films with the 1st actor, Clint Eastwood.

▼ Hint

Follow example 2 of DISTINCT. Use the WHERE clause comparison operator =, which means **Equal to**.

▼ Query Solution

''' SELECT COUNT(DISTINCT Distributor) FROM FilmLocations WHERE Actor1="Clint Eastwood"; '''

▼ Output

Practice SQL

Database: SanFranciscoFilmLocations

1

SELECT COUNT(DISTINCT Distributor) FROM FilmLocations WHERE Actor1="Clint Eastwood";

Submit query

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Results

All commands ran successfully

SELECT COUNT(DISTINCT Distributor) FROM FilmLocations WHERE Actor1="Clint Eastwood"

COUNT(DISTINCT Distributor)
3

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Practice exercises

LIMIT

1. Retrieve the names of the first 50 films.

▼ Hint

Follow example 1 of LIMIT. Use DISTINCT.

▼ Query Solution

''' SELECT DISTINCT Title FROM FilmLocations LIMIT 50; '''

▼ Output

Practice SQL

Database: SanFranciscoFilmLocations

1

SELECT DISTINCT Title FROM FilmLocations LIMIT 50;

Submit query

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Results

All commands ran successfully

SELECT DISTINCT Title FROM FilmLocations LIMIT 50

Title
180
24 Hours on Capital
A Night Out of Rain
About a Boy
Age of Adaline
After the Thin Man
Ami-Man
Americana
Another 48 Hours
Around the Fire
Attack of the Killer Tomatoes

2. Retrieve the first 10 film names released in 2015.

▼ Hint

Follow example 1 of LIMIT. Use DISTINCT. Use WHERE clause comparison operator =, which means **Equal to**.

▼ Query Solution

```SELECT DISTINCT Title FROM FilmLocations WHERE ReleaseYear=2015 LIMIT 10; ```

▼ Output

Practice SQL

Database: SanFranciscoFilmLocations

1

SELECT DISTINCT Title FROM FilmLocations WHERE ReleaseYear=2015 LIMIT 10;

Submit query

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Results

All commands ran successfully

SELECT DISTINCT Title FROM FilmLocations WHERE ReleaseYear=2015 LIMIT 10

Title
Age of Adaline
Ami-Man
Americana
Summertime
Cardinal X
I Am Michael
Stone John
Quitters
San Andreas
Snow8

3. Retrieve the next 3 film names that follow after the first 5 films released in 2015.

▼ Hint

Follow example 2 of the LIMIT exercise to learn how to use OFFSET. Use DISTINCT and use the WHERE clause comparison operator =, which means **Equal to**.

▼ Query Solution

SELECT DISTINCT Title FROM FilmLocations WHERE ReleaseYear=2015 LIMIT 3 OFFSET 5;

▼ Output

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Practice SQL

Database: SanFranciscoFilmLocations

1

SELECT DISTINCT Title FROM FilmLocations WHERE ReleaseYear=2015 LIMIT 3 OFFSET 5;

Submit query

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Results

All commands ran successfully

SELECT DISTINCT Title FROM FilmLocations WHERE ReleaseYear=2015 LIMIT 3 OFFSET 5

Title
I Am Michael
Stone John
Quitters

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# Conclusion

Congratulations! You have completed this lab.

You are now able to:

- Use COUNT statements to determine the number of entries in a database based on filtering conditions.
- Use DISTINCT statements to determine the unique entries in a database based on filtering conditions.
- Use LIMIT statements to restrict the response to a desired set of rows based on filtering conditions.
- Use a combination of these statements to execute more complex queries on the database.

Author(s)

[Sandip Saha Joy](#)

Other Contributor(s)

[Abhishek Gagneja](#)

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