



AWS  
re:Start  
LAB

# Selecting Data from a Database



WEEK 7





# Overview

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Mastering database querying techniques is important because it enables users to retrieve specific data sets efficiently, tailored to their needs. This capability is essential for generating accurate reports, conducting in-depth analysis, and making informed decisions based on relevant information. By understanding how to construct effective queries using the SELECT statement, users can extract valuable insights from vast databases, supporting strategic planning and business intelligence initiatives.

Furthermore, developing skills in data retrieval and manipulation allows for better data management practices. Being able to filter, sort, and aggregate data effectively improves data quality and usability, leading to more accurate analyses and decision-making processes. These capabilities are particularly valuable in today's data-driven world, where organizations rely on actionable insights derived from data to drive growth, optimize operations, and stay competitive in their respective industries.

## Topics covered

- Use the SELECT statement to query a database
- Use the COUNT() function
- Use the operators <, >, =, WHERE, ORDER BY and AND to query a database.

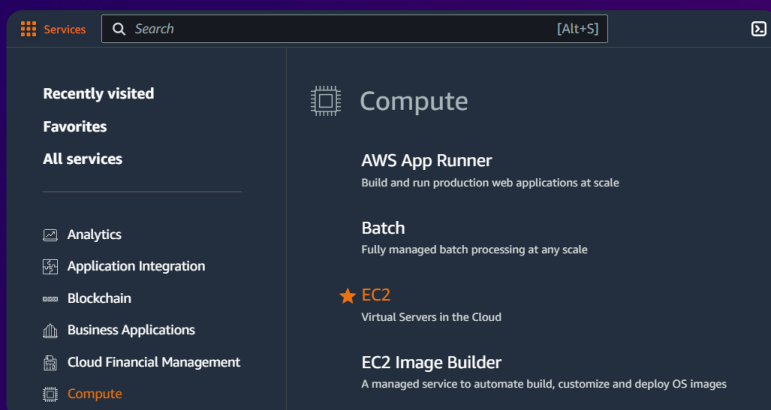


# Task 1

## Connect to the Command Host

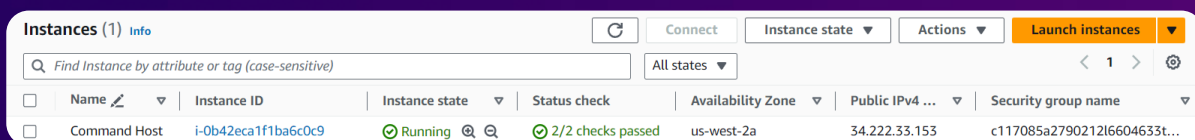
### Step 1: Access the EC2 Management Console

Open the AWS Management Console, and select EC2.



### Step 2: Review running instances

Navigate to the **Instances** section. The running **Command Host** instance is listed.



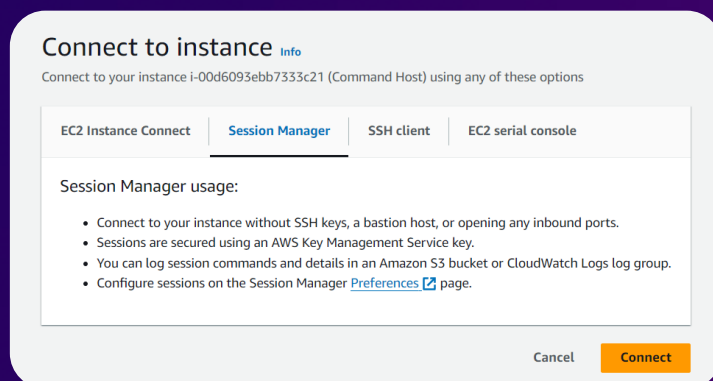


# Task 1

## Connect to the Command Host

### Step 3: Connect to the instance

Connect to the **Command Host** EC2 instance, which contains a database client, using [Session Manager](#).



### Step 4: Connect to the database server

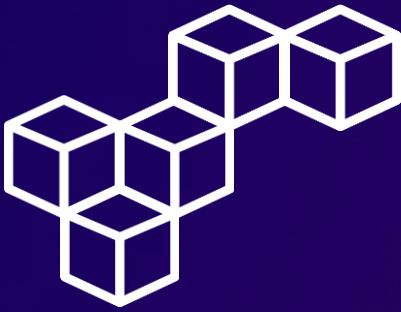
To connect to the database server, run the following commands in the terminal.

```
sh-4.2$ sudo su
[root@ip-10-1-11-193 bin]# cd /home/ec2-user/
[root@ip-10-1-11-193 ec2-user]# mysql -u root --password='re:St@rt!9'
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 14
Server version: 10.6.17-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> |
```



# Task 2

## Query the world database

### Step 1: Show existing databases

Show the existing databases using the **SHOW DATABASES** query, and verify that a database named **world** is available.

```
MariaDB [(none)]> SHOW DATABASES;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
| world |
+-----+
5 rows in set (0.004 sec)
```

### Step 2: List all rows and columns

List all rows and columns in the **country** table using the **SELECT \* FROM** statement.

Code	Name	Continents	Region	SurfaceArea	IndepYear	Population	LifeExpectancy	GDP	GDP1d	LocalName	GovernmentForm	Capital	Code2
ARM	Aruba	North America	Caribbean	183.00	NULL	102000	78.4	828.00	798.00	Aruba	Monarchical Territory of The Netherlands	129	AW
AFG	Afghanistan	Asia	Southern and Central Asia	652000.00	1919	22720000	48.9	5976.00	NULL	Afghanistan/Afghanistan	Islamic Emirate	1	AF
AGO	Angola	Africa	Central Africa	1246700.00	1975	12878000	38.3	6648.00	7064.00	Angola	Republic	56	AO
ATA	Anguilla	North America	Caribbean	64.00	NULL	8000	76.1	42.20	NULL	Anguilla	Dependent Territory of the UK	62	AI
ALB	Albania	Europe	Southern Europe	28748.00	1912	241200	71.6	2280.00	2800.00	Shqipëria	Republic	24	AL
AND	Andorra	Europe	Southern Europe	468.00	1278	78000	82.5	1630.00	NULL	Andorra	Parliamentary Coprincipality	55	AD
ANT	Netherlands Antilles	North America	Caribbean	800.00	NULL	217000	74.7	1941.00	NULL	Nederlandse Antillen	Monarchical Territory of The Netherlands	20	AN
ARE	United Arab Emirates	Asia	Middle East	10600.00	1971	2443000	74.1	37346.00	28846.00	al-'Imarat al-'Arabiya al-Musabida	Emirate Federation	60	AE
ARG	Argentina	South America	South America	2780400.00	1916	37020000	73.1	24028.00	222610.00	Argentina	Federal Republic	69	AR
ARM	Armenia	Asia	Middle East	29600.00	1991	3320000	68.4	1812.00	1627.00	Armenia	Republic	126	AM
ASM	American Samoa	Oceania	Pacific	199.00	NULL	68000	70.1	284.00	NULL	American Samoa	US Territory	54	AS
ATA	Antarctica	Antarctica	Antarctica	13120000.00	NULL	0	NULL	0.00	NULL	-	Co-administrated	NULL	AQ
ATF	French Southern Territories	Antarctica	Antarctica	7700.00	NULL	0	NULL	0.00	NULL	Territoires australes françaises	Monarchical Territory of France	NULL	TF
ATG	Antigua and Barbuda	North America	Caribbean	442.00	1981	68000	70.5	412.00	584.00	Antigua and Barbuda	Constitutional Monarchy	60	AG
AUS	Australia	Oceania	Australia and New Zealand	7741200.00	1901	18886000	78.9	311152.00	353911.00	Australia	Constitutional Monarchy, Federation	133	AO
AUT	Austria	Europe	Western Europe	83859.00	1948	8084000	77.7	211800.00	200626.00	Österreich	Federal Republic	123	AT
AZE	Azerbaijan	Asia	Middle East	86600.00	1991	7784000	62.9	4127.00	4100.00	Azərbaycan	Federal Republic	144	AZ
BFA	Burkina Faso	Africa	Eastern Africa	27834.00	1962	6660000	46.2	902.00	982.00	Burkina Faso	Republic	552	BF
BEL	Belgium	Europe	Western Europe	30328.00	1830	10230000	77.8	24974.00	243546.00	België/Belgique	Constitutional Monarchy, Federation	278	BE
BEN	Benin	Africa	Western Africa	112622.00	1960	6097000	50.2	2187.00	2141.00	Bénin	Republic	167	BJ
BFA	Burkina Faso	Africa	Western Africa	274000.00	1960	11597000	46.7	4366.00	2201.00	Burkina Faso	Republic	549	BF
BGL	Bulgaria	Europe	Southern and Central Asia	1126430.00	1971	10243000	69.2	22282.00	21866.00	България	Republic	120	BG
BGR	Bulgaria	Europe	Eastern Europe	110894.00	1909	8190000	70.9	12178.00	10169.00	България	Republic	539	BS
BHR	Bahrain	Asia	Middle East	694.00	1971	417000	72.0	4366.00	6097.00	al-Bahrayn	Monarchy (Emirate)	149	HR
BHS	Bahamas	North America	Caribbean	13978.00	1979	397000	71.1	827.00	2947.00	The Bahamas	Constitutional Monarchy	149	BS
BHM	Bosnia and Herzegovina	Europe	Southern Europe	51197.00	1992	3972000	71.5	2841.00	NULL	Bosnia & Herzegovina	Federal Republic	201	BA
BLA	Belarus	Europe	Eastern Europe	207600.00	1991	10236000	68.0	13714.00	NULL	Belarus	Republic	2520	BY
BLZ	Belize	North America	Central America	22696.00	1981	241800	70.9	600.00	614.00	Belize	Constitutional Monarchy	189	BZ
BMD	Bermuda	North America	North America	52.00	NULL	68000	76.9	2228.00	2190.00	Bermuda	Dependent Territory of the UK	191	BM
BOL	Bolivia	South America	South America	1098381.00	1825	8329000	60.7	4971.00	7947.00	Bolivia	Republic	154	BO
BRA	Brazil	South America	South America	8547462.00	1922	170131000	62.4	716738.00	804109.00	Brasil	Federal Republic	211	BR
BRS	Brasão	North America	Caribbean	430.00	1966	270000	72.0	2222.00	2196.00	Brasão	Constitutional Monarchy	174	BS
BUN	Bunel	Asia	Southeast Asia	5748.00	1964	238000	70.6	1702.00	12440.00	Bunel, Darussalam	Monarchy (Sultanate)	588	BN
BVT	Bouvet	Europe	Southern and Central Asia	47000.00	1940	214000	52.4	272.00	283.00	Bouvet	Monarchy	189	BT
BUT	Bhutan	Asia	Southeast Asia	38.00	1960	270000	70.6	1702.00	12440.00	Bhutan	Monarchy (Sultanate)	588	BN
BWA	Botswana	Africa	Central Africa	367000.00	1966	1821000	59.9	484.00	648.00	Botswana	Republic	204	BS
CAF	Central African Republic	Africa	Central Africa	622984.00	1960	2613000	44.0	1084.00	1084.00	Centrafrique/Ré-Afrika	Republic	189	CF
CAN	Canada	North America	North America	9970415.00	1967	21170000	78.4	389862.00	420426.00	Canada	Constitutional Monarchy, Federation	1022	CA
CCK	Cocos (Keeling) Islands	Oceania	Australia and New Zealand	14.00	NULL	600	NULL	0.00	NULL	Cocos (Keeling) Islands	Territory of Australia	2207	CC
CHE	Switzerland	Europe	Western Europe	41284.00	1499	7160400	79.6	264478.00	250092.00	Schweiz/Suisse/Svizzera/Svizra	Federation	245	CH
CHL	Chile	South America	South America	756626.00	1810	15211000	75.7	72949.00	79780.00	Chile	Republic	554	CL
CHN	China	Asia	Southeast Asia	9597000.00	1922	1277800000	69.4	22240.00	91714.00	Zhongguo	People's Republic	1024	CN
CMR	Cameroon	Africa	Central Africa	474452.00	1960	15080000	54.8	9174.00	8596.00	Cameroon/Cameroun	Republic	1804	CM
CPV	Cape Verde	Africa	Central Africa	244838.00	1975	2654000	68.9	404.00	2474.00	República Democrática de Cabo Verde	Republic	2209	CV
COD	Congo, The Democratic Republic of the	Africa	Central Africa	342000.00	1960	2548000	47.4	2100.00	2207.00	Congo	Republic	2296	CD



## Task 2

# Query the world database

### Step 3: List the number of rows

To query the number of rows in a table, you can use the `COUNT()` function in a `SELECT` statement. List the number of rows in the `country` table

```
MariaDB [(none)]> SELECT COUNT(*) FROM world.country;
+-----+
| COUNT(*) |
+-----+
|      239 |
+-----+
1 row in set (0.001 sec)
```

### Step 4: List all columns

List all columns in the `country` table using the `SHOW COLUMNS FROM` query.

```
MariaDB [(none)]> SHOW COLUMNS FROM world.country;
```

Field	Type	Null	Key	Default	Extra
Code	char(3)	NO	PRI		
Name	char(52)	NO			
Continent	enum('Asia','Europe','North America','Africa','Oceania','Antarctica','South America')	NO		Asia	
Region	char(26)	NO			
SurfaceArea	decimal(10,2)	NO		0.00	
IndepYear	smallint(6)	YES		NULL	
Population	int(11)	NO		0	
LifeExpectancy	decimal(3,1)	YES		NULL	
GNP	decimal(10,2)	YES		NULL	
GNPOld	decimal(10,2)	YES		NULL	
LocalName	char(45)	NO			
GovernmentForm	char(45)	NO			
Capital	int(11)	YES		NULL	
Code2	char(2)	NO			

```
14 rows in set (0.001 sec)
```



## Task 2

# Query the world database

### Step 5: Query specific columns

Query specific columns in the **country** table.

```
MariaDB [(none)]> SELECT Name, Capital, Region, SurfaceArea, Population FROM world.country;
```

Name	Capital	Region	SurfaceArea	Population
Aruba	129	Caribbean	193.00	103000
Afghanistan	1	Southern and Central Asia	652090.00	22720000
Angola	56	Central Africa	1246700.00	12878000
Anguilla	62	Caribbean	96.00	8000
Albania	34	Southern Europe	28748.00	3401200
Andorra	55	Southern Europe	468.00	78000
Netherlands Antilles	33	Caribbean	800.00	217000
United Arab Emirates	65	Middle East	83600.00	2441000
Argentina	69	South America	2780400.00	37032000
Armenia	126	Middle East	29800.00	3520000
American Samoa	54	Polynesia	199.00	68000

### Step 6: Add a column alias

Add a more descriptive column name to the query output using the **AS** option.

```
MariaDB [(none)]> SELECT Name, Capital, Region, SurfaceArea AS "Surface Area", Population FROM world.country;
```

Name	Capital	Region	Surface Area	Population
Aruba	129	Caribbean	193.00	103000
Afghanistan	1	Southern and Central Asia	652090.00	22720000
Angola	56	Central Africa	1246700.00	12878000
Anguilla	62	Caribbean	96.00	8000
Albania	34	Southern Europe	28748.00	3401200
Andorra	55	Southern Europe	468.00	78000
Netherlands Antilles	33	Caribbean	800.00	217000
United Arab Emirates	65	Middle East	83600.00	2441000
Argentina	69	South America	2780400.00	37032000
Armenia	126	Middle East	29800.00	3520000
American Samoa	54	Polynesia	199.00	68000





# Task 2

## Query the world database

### Step 7: Order the query output

Order the output based on a column using the **ORDER BY** option. The **ORDER BY** option orders data in ascending order.

```
MariaDB [(none)]> SELECT Name, Capital, Region, SurfaceArea AS "Surface Area", Population FROM world.country ORDER BY Population;
```

Name	Capital	Region	Surface Area	Population
French Southern territories	NULL	Antarctica	7780.00	0
Heard Island and McDonald Islands	NULL	Antarctica	359.00	0
United States Minor Outlying Islands	NULL	Micronesia/Caribbean	16.00	0
South Georgia and the South Sandwich Islands	NULL	Antarctica	3903.00	0
Bouvet Island	NULL	Antarctica	59.00	0
British Indian Ocean Territory	NULL	Eastern Africa	78.00	0
Antarctica	NULL	Antarctica	13120000.00	0
Pitcairn	2912	Polynesia	49.00	50
Cocos (Keeling) Islands	2317	Australia and New Zealand	14.00	600
Holy See (Vatican City State)	3538	Southern Europe	0.40	1000
Niue	2805	Polynesia	260.00	2000
Tokelau	3333	Polynesia	12.00	2000
Falkland Islands	763	South America	12173.00	2000

### Step 8: Order the data in descending order

To order data in descending order, use the **DESC** option with **ORDER BY**.

```
MariaDB [(none)]> SELECT Name, Capital, Region, SurfaceArea AS "Surface Area", Population FROM world.country ORDER BY Population DESC;
```

Name	Capital	Region	Surface Area	Population
China	1891	Eastern Asia	9572900.00	127758000
India	1109	Southern and Central Asia	3287263.00	1013662000
United States	3813	North America	9363520.00	278357000
Indonesia	939	Southeast Asia	1904569.00	212107000
Brazil	211	South America	8547403.00	170115000
Pakistan	2831	Southern and Central Asia	796095.00	156483000
Russian Federation	3580	Eastern Europe	17075400.00	146934000
Bangladesh	150	Southern and Central Asia	143998.00	129155000
Japan	1532	Eastern Asia	377829.00	126714000
Nigeria	2754	Western Africa	923768.00	111506000
Mexico	2515	Central America	1958201.00	98881000
Germany	3068	Western Europe	357022.00	82164700
Vietnam	3770	Southeast Asia	331689.00	79832000
Philippines	766	Southeast Asia	300000.00	75967000





## Task 2

# Query the world database

### Step 9: Add a condition

Add a condition to the **SELECT** statement using the **WHERE** clause.

```
MariaDB [(none)]> SELECT Name, Capital, Region, SurfaceArea AS "Surface Area", Population FROM world.country WHERE Population > 50000000 ORDER BY Population DESC;
```

Name	Capital	Region	Surface Area	Population
China	1891	Eastern Asia	9572900.00	1277558000
India	1109	Southern and Central Asia	3287263.00	1013662000
United States	3813	North America	9363520.00	278357000
Indonesia	939	Southeast Asia	1904569.00	212107000
Brazil	211	South America	8547403.00	170115000
Pakistan	2831	Southern and Central Asia	796095.00	156483000
Russian Federation	3580	Eastern Europe	17075400.00	146934000
Bangladesh	150	Southern and Central Asia	143998.00	129155000
Japan	1532	Eastern Asia	377829.00	126714000

### Step 10: Add multiple conditions

Add multiple conditions to the **SELECT** statement using the **WHERE** clause and the **AND** operator.

```
MariaDB [(none)]> SELECT Name, Capital, Region, SurfaceArea AS "Surface Area", Population FROM world.country WHERE Population > 50000000 AND Population < 100000000 ORDER BY Population DESC;
```

Name	Capital	Region	Surface Area	Population
Mexico	2515	Central America	1958201.00	98881000
Germany	3068	Western Europe	357022.00	82164700
Vietnam	3770	Southeast Asia	331689.00	79832000
Philippines	766	Southeast Asia	300000.00	75967000
Egypt	608	Northern Africa	1001449.00	68470000
Iran	1380	Southern and Central Asia	1648195.00	67702000
Turkey	3358	Middle East	774815.00	66591000
Ethiopia	756	Eastern Africa	1104300.00	62565000
Thailand	3320	Southeast Asia	513115.00	61399000
United Kingdom	456	British Islands	242900.00	59623400
France	2974	Western Europe	551500.00	59225700
Italy	1464	Southern Europe	301316.00	57680000



# Conclusions

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## **The SELECT statement**

The SELECT statement is fundamental for retrieving specific data from databases, enabling users to customize queries and extract relevant information efficiently.

## **The COUNT( ) function**

The COUNT( ) function provides valuable insights into dataset size and numerical analysis, aiding in trend identification and performance evaluation.

## **The WHERE clause**

The WHERE clause allows for filtering data based on specific conditions, ensuring that only relevant data is included in query results.

## **The ORDER BY clause**

The ORDER BY clause is essential for sorting query results in ascending or descending order, improving data presentation and analysis.

## **The AND clause**

The AND clause enhances query precision by allowing multiple conditions to be applied simultaneously, refining data retrieval and analysis capabilities.



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