AWS re:Start LAB

Performing a Conditional Search

WEEK 7

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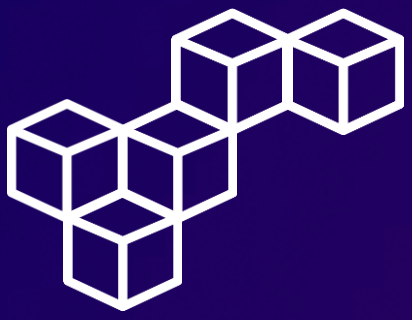


Overview

Performing a conditional search in database queries is essential for precision in data retrieval. By utilizing the WHERE clause effectively, users can define specific criteria that filter out irrelevant data and focus on retrieving records that match particular conditions. This approach ensures that only the necessary information is included in query results, facilitating efficient analysis and decision-making.

Furthermore, incorporating functions within SELECT statements and WHERE clauses adds versatility to search operations. Functions enable users to calculate, transform, or manipulate data before retrieval, allowing for dynamic search conditions. This flexibility enhances the ability to perform complex searches and tailor data retrieval to meet specific business requirements or analysis needs. In summary, mastering conditional search techniques optimizes data retrieval, leading to more accurate analysis and informed decision-making processes.

Topics covered

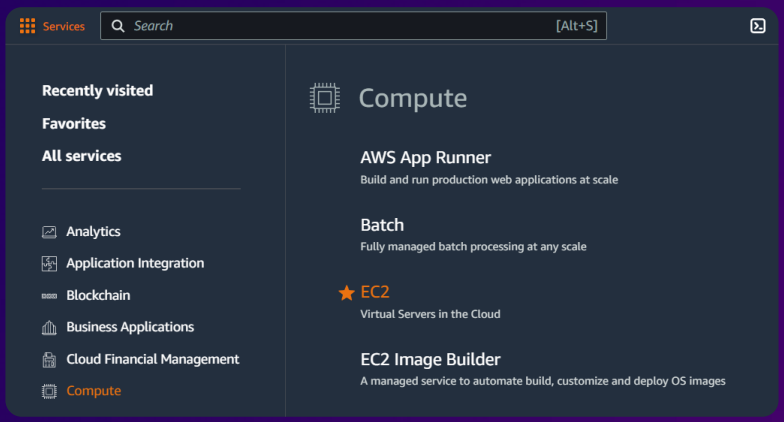
- Write a search condition by using the WHERE clause
- Use the BETWEEN operator
- Use the LIKE operator with wildcard characters
- Use the AS operator to create a column alias
- Use functions in a SELECT statement
- Use functions in a WHERE clause

Task 1

Connect to the Command Host

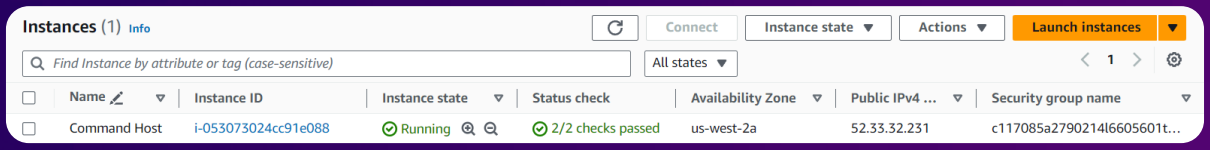
Step 1: Access the EC2 Management Console

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.



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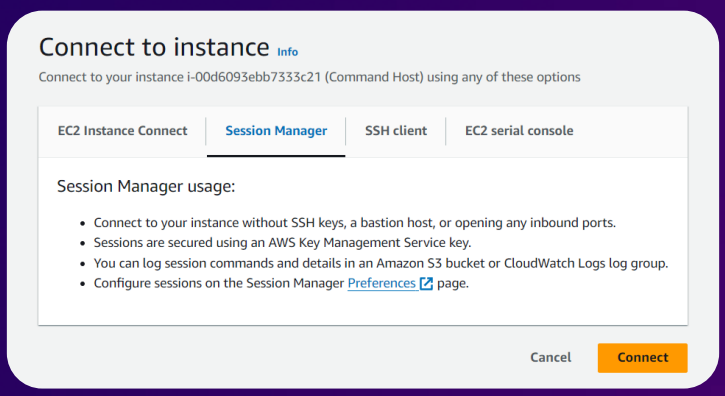
Task 1

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-10-1-11-227 bin]# cd /home/ec2-user/
[root@ip-10-1-11-227 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)]>
```

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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 (0.003 sec)
```

Step 2: Review the table schema

Review the table schema, data, and number of rows in the **country** table, using the SELECT * FROM statement.

```
MariaDB [(none)]> SELECT * FROM world.country;
```

Code	Name	Continent	Region	SurfaceArea	IndepYear	Population	LifeExpectancy	GNP	GNPOld	LocalName	GovernmentForm	HeadOfState	Capital	Code2
ABW	Aruba	North America	Caribbean	193.00	NULL	103000	78.4	828.00	793.00	Aruba	Nonmetropolitan Territory of The Netherlands	Beatrix	129	AW
AFG	Afghanistan	Asia	Southern and Central Asia	652090.00	1919	22720000	45.9	5976.00	NULL	Afganistan/Afqanestan	Islamic Emirate	Mohammad Omar	1	AF
AGO	Angola	Africa	Central Africa	1246700.00	1975	12878000	38.3	6648.00	7984.00	Angola	Republic	JosÃ© Eduardo dos Santos	56	AO
AIA	Anguilla	North America	Caribbean	96.00	NULL	8000	76.1	63.20	NULL	Anguilla	Dependent Territory of the UK	Elisabeth II	62	AI
ALB	Albania	Europe	Southern Europe	28748.00	1912	3401200	71.6	3205.00	2500.00	ShqipÃ«ria	Republic	Rexhep Mejdani	34	AL
AND	Andorra	Europe	Southern Europe	468.00	1278	78000	83.5	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	Nonmetropolitan Territory of The Netherlands	Beatrix	33	AN
ARE	United Arab Emirates	Asia	Middle East	83600.00	1971	2441000	74.1	37966.00	36846.00	Al-Imarat al-Ê¿Arabiya al-Muttahida	Emirate Federation	Zayid bin Sultan al-Nahayan	65	AE
ARG	Argentina	South America	South America	2780400.00	1816	37032000	75.1	340238.00	323310.00	Argentina	Federal Republic	Fernando de la RÃºa	69	AR
ARM	Armenia	Asia	Middle East	29800.00	1991	3520000	66.4	1813.00	1627.00	Hajastan	Republic	Robert KotÅ¡arjan	126	AM
ASM	American Samoa	Oceania	Polynesia	199.00	NULL	68000	75.1	334.00	NULL	Amerika Samoa	US Territory	George W. Bush	54	AS
ATA	Antarctica	Antarctica	Antarctica	13120000.00	NULL	0	NULL	0.00	NULL	â€“	Co-administrated		NULL	AQ
ATF	French Southern territories	Antarctica	Antarctica	7780.00	NULL	0	NULL	0.00	NULL	Terres australes franÃ§aises	Nonmetropolitan Territory of France	Jacques Chirac	NULL	TF
ATG	Antigua and Barbuda	North America	Caribbean	442.00	1981	68000	70.5	612.00	584.00	Antigua and Barbuda	Constitutional Monarchy	Elisabeth II	63	AG
AUS	Australia	Oceania	Australia and New Zealand	7741220.00	1901	18886000	79.8	351182.00	392911.00	Australia	Constitutional Monarchy, Federation	Elisabeth II	135	AU
AUT	Austria	Europe	Western Europe	83859.00	1918	8091800	77.7	211860.00	206025.00	Ã–sterreich	Federal Republic	Thomas Klestil	1523	AT
AZE	Azerbaijan	Asia	Middle East	86600.00	1991	7734000	62.9	4127.00	4100.00	AzÃ¤rbaycan	Federal Republic	HeydÃ¤r Ã„liyev	144	AZ
BDI	Burundi	Africa	Eastern Africa	27834.00	1962	6695000	46.2	903.00	982.00	Burundi/Uburundi	Republic	Pierre Buyoya	552	BI
BEL	Belgium	Europe	Western Europe	30518.00	1830	10239000	77.8	249704.00	243948.00	BelgiÃ«/Belgique	Constitutional Monarchy, Federation	Albert II	179	BE
BEN	Benin	Africa	Western Africa	112622.00	1960	6097000	50.2	2357.00	2141.00	BÃ©nin	Republic	Mathieu KÃ©rÃ©kou	187	BJ
BFA	Burkina Faso	Africa	Western Africa	274000.00	1960	11937000	46.7	2425.00	2201.00	Burkina Faso	Republic	Blaise CompaorÃ©	549	BF
BGD	Bangladesh	Asia	Southern and Central Asia	143998.00	1971	129155000	60.2	32852.00	31966.00	Bangladesh	Republic	Shahabuddin Ahmad	150	BD
BGR	Bulgaria	Europe	Eastern Europe	110994.00	1908	8190900	70.9	12178.00	10169.00	Balgarija	Republic	Petar Stojanov	539	BG
BHR	Bahrain	Asia	Middle East	694.00	1971	617000	73.0	6366.00	6097.00	Al-Bahrayn	Monarchy (Emirate)	Hamad ibn Isa al-Khalifa	149	BH
BHS	Bahamas	North America	Caribbean	13878.00	1973	307000	71.1	3527.00	3347.00	The Bahamas	Constitutional Monarchy	Elisabeth II	148	BS
BIH	Bosnia and Herzegovina	Europe	Southern Europe	51197.00	1992	3972000	71.5	2841.00	NULL	Bosna i Hercegovina	Federal Republic	Ante Jelavic	201	BA
BLR	Belarus	Europe	Eastern Europe	207600.00	1991	10236000	68.0	13714.00	NULL	Belarus	Republic	Aljaksandr LukaÅ¡enka	3520	BY
BLZ	Belize	North America	Central America	22696.00	1981	241000	70.9	630.00	616.00	Belize	Constitutional Monarchy	Elisabeth II	185	BZ
BMU	Bermuda	North America	North America	53.00	NULL	65000	76.9	2328.00	2190.00	Bermuda	Dependent Territory of the UK	Elisabeth II	191	BM
BOL	Bolivia	South America	South America	1098581.00	1825	8329000	63.7	8571.00	7967.00	Bolivia	Republic	Hugo BÃ¡nzer SuÃ¡rez	194	BO
BRA	Brazil	South America	South America	8547403.00	1822	170115000	62.9	776739.00	804108.00	Brasil	Federal Republic	Fernando Henrique Cardoso	211	BR
BRB	Barbados	North America	Caribbean	430.00	1966	270000	73.0	2223.00	2186.00	Barbados	Constitutional Monarchy	Elisabeth II	174	BB
BRN	Brunei	Asia	Southeast Asia	5765.00	1984	328000	73.6	11705.00	12460.00	Brunei Darussalam	Monarchy (Sultanate)	Haji Hassan al-Bolkiah	538	BN
BTN	Bhutan	Asia	Southern and Central Asia	47000.00	1910	2124000	52.4	372.00	383.00	Druk-Yul	Monarchy	Jigme Singye Wangchuk	192	BT
BVT	Bouvet Island	Antarctica	Antarctica	59.00	NULL	0	NULL	0.00	NULL	BouvetÃ¸ya	Dependent Territory of Norway	Harald V	NULL	BV
BWA	Botswana	Africa	Southern Africa	581730.00	1966	1622000	39.3	4834.00	4935.00	Botswana	Republic	Festus G. Mogae	204	BW
CAF	Central African Republic	Africa	Central Africa	622984.00	1960	3615000	44.0	1054.00	993.00	Centrafrique/BÃª-AfrÃ®ka	Republic	Ange-FÃ©lix PatassÃ©	1889	CF
CAN	Canada	North America	North America	9970610.00	1867	31147000	79.4	598862.00	625626.00	Canada	Constitutional Monarchy, Federation	Elisabeth II	1822	CA
CCK	Cocos (Keeling) Islands	Oceania	Australia and New Zealand	14.00	NULL	600	NULL	0.00	NULL	Cocos (Keeling) Islands	Territory of Australia	Elisabeth II	2317	CC
CHE	Switzerland	Europe	Western Europe	41284.00	1499	7160400	79.6	264478.00	256092.00	Schweiz/Suisse/Svizzera/Svizra	Federation	Adolf Ogi	3248	CH
CHL	Chile	South America	South America	756626.00	1810	15211000	75.7	72949.00	75780.00	Chile	Republic	Ricardo Lagos Escobar	554	CL
CHN	China	Asia	Eastern Asia	9572900.00	-1523	1277558000	71.4	982268.00	917719.00	Zhongquo	Peoples Republic	Jiang Zemin	1891	CN
CIV	CÃ´te dâ€™Ivoire	Africa	Western Africa	322463.00	1960	14786000	45.2	11345.00	10285.00	CÃ´te dâ€™Ivoire	Republic	Laurent Gbagbo	2814	CI
CMR	Cameroon	Africa	Central Africa	475442.00	1960	15085000	54.8	9174.00	8596.00	Cameroun/Cameroon	Republic	Paul Biya	1804	CM

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Task 2

Query the world database

Step 3: Use the AND operator

Reduce the number of records in the result set by using a WHERE clause and the AND operator.

```
MariaDB [(none)]> SELECT Name, Capital, Region, SurfaceArea, Population FROM world.country WHERE Population >= 50000000
 AND Population <= 100000000;
+---------------------------------------+---------+--------------------------+-------------+------------+
| Name                                  | Capital | Region                   | SurfaceArea | Population |
+---------------------------------------+---------+--------------------------+-------------+------------+
| Congo, The Democratic Republic of the |    2298 | Central Africa           |  2344858.00 |   51654000 |
| Germany                               |    3068 | Western Europe           |   357022.00 |   82164700 |
| Egypt                                 |     608 | Northern Africa          |  1001449.00 |   68470000 |
| Ethiopia                              |     756 | Eastern Africa           |  1104300.00 |   62565000 |
| France                                |    2974 | Western Europe           |   551500.00 |   59225700 |
| United Kingdom                        |     456 | British Islands          |   242900.00 |   59623400 |
| Iran                                  |    1380 | Southern and Central Asia |  1648195.00 |   67702000 |
| Italy                                 |    1464 | Southern Europe          |   301316.00 |   57680000 |
| Mexico                                |    2515 | Central America          |  1958201.00 |   98881000 |
| Philippines                           |     766 | Southeast Asia           |   300000.00 |   75967000 |
| Thailand                              |    3320 | Southeast Asia           |   513115.00 |   61399000 |
| Turkey                                |    3358 | Middle East              |   774815.00 |   66591000 |
| Ukraine                               |    3426 | Eastern Europe           |   603700.00 |   50456000 |
| Vietnam                               |    3770 | Southeast Asia           |   331689.00 |   79832000 |
+---------------------------------------+---------+--------------------------+-------------+------------+
14 rows in set (0.000 sec)
```

Step 4: Use the BETWEEN operator

Return the same records as the previous result set by using the BETWEEN operator.

```
MariaDB [(none)]> SELECT Name, Capital, Region, SurfaceArea, Population FROM world.country WHERE Population
 BETWEEN 50000000 AND 100000000;
+---------------------------------------+---------+--------------------------+-------------+------------+
| Name                                  | Capital | Region                   | SurfaceArea | Population |
+---------------------------------------+---------+--------------------------+-------------+------------+
| Congo, The Democratic Republic of the |    2298 | Central Africa           |  2344858.00 |   51654000 |
| Germany                               |    3068 | Western Europe           |   357022.00 |   82164700 |
| Egypt                                 |     608 | Northern Africa          |  1001449.00 |   68470000 |
| Ethiopia                              |     756 | Eastern Africa           |  1104300.00 |   62565000 |
| France                                |    2974 | Western Europe           |   551500.00 |   59225700 |
| United Kingdom                        |     456 | British Islands          |   242900.00 |   59623400 |
| Iran                                  |    1380 | Southern and Central Asia |  1648195.00 |   67702000 |
| Italy                                 |    1464 | Southern Europe          |   301316.00 |   57680000 |
| Mexico                                |    2515 | Central America          |  1958201.00 |   98881000 |
| Philippines                           |     766 | Southeast Asia           |   300000.00 |   75967000 |
| Thailand                              |    3320 | Southeast Asia           |   513115.00 |   61399000 |
| Turkey                                |    3358 | Middle East              |   774815.00 |   66591000 |
| Ukraine                               |    3426 | Eastern Europe           |   603700.00 |   50456000 |
| Vietnam                               |    3770 | Southeast Asia           |   331689.00 |   79832000 |
+---------------------------------------+---------+--------------------------+-------------+------------+
14 rows in set (0.000 sec)
```

Task 2

Query the world database

Step 5: Use the LIKE operator

Return the population of all European countries by using the LIKE operator and SUM function.

```
MariaDB [(none)]> SELECT SUM(Population) FROM world.country WHERE Region LIKE "%Europe%";
+-----------------+
| SUM(Population) |
+-----------------+
|       634947800 |
+-----------------+
1 row in set (0.000 sec)
```

Step 6: Use the AS command

Return the same information as the previous query with the column alias, using the AS command.

```
MariaDB [(none)]> SELECT SUM(population) AS "Europe Population Total" FROM world.country WHERE region LIKE "%Europe%";
+-------------------------+
| Europe Population Total |
+-------------------------+
|               634947800 |
+-------------------------+
1 row in set (0.000 sec)
```

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Task 2

Query the world database

Step 7: Use the LOWER( ) function

Perform a case-sensitive search by using the LOWER( ) function.

```
MariaDB [(none)]> SELECT Name, Capital, Region, SurfaceArea, Population FROM world.country WHERE LOWER(Region) LIKE "%central%";
+-------------------------------------+---------+-------------------------+-------------+------------+
| Name                                | Capital | Region                  | SurfaceArea | Population |
+-------------------------------------+---------+-------------------------+-------------+------------+
| Afghanistan                         |       1 | Southern and Central Asia |    652090.00 |   22720000 |
| Angola                              |      56 | Central Africa          |   1246700.00 |   12878000 |
| Bangladesh                          |     150 | Southern and Central Asia |    143998.00 |  129155000 |
| Belize                              |     185 | Central America         |     22696.00 |     241000 |
| Bhutan                              |     192 | Southern and Central Asia |     47000.00 |    2124000 |
| Central African Republic            |    1889 | Central Africa          |    622984.00 |    3615000 |
| Cameroon                            |    1804 | Central Africa          |    475442.00 |   15085000 |
| Congo, The Democratic Republic of the |    2298 | Central Africa          |   2344858.00 |   51654000 |
| Congo                               |    2296 | Central Africa          |    342000.00 |    2943000 |
| Costa Rica                          |     584 | Central America         |     51100.00 |    4023000 |
| Gabon                               |     902 | Central Africa          |    267668.00 |    1226000 |
| Equatorial Guinea                   |    2972 | Central Africa          |     28051.00 |     453000 |
| Guatemala                           |     922 | Central America         |    108889.00 |   11385000 |
| Honduras                            |     933 | Central America         |    112088.00 |    6485000 |
| India                               |    1109 | Southern and Central Asia |   3287263.00 | 1013662000 |
| Iran                                |    1380 | Southern and Central Asia |   1648195.00 |   67702000 |
| Kazakstan                           |    1864 | Southern and Central Asia |   2724900.00 |   16223000 |
| Kyrgyzstan                          |    2253 | Southern and Central Asia |    199900.00 |    4699000 |
| Sri Lanka                           |    3217 | Southern and Central Asia |     65610.00 |   18827000 |
| Maldives                            |    2463 | Southern and Central Asia |       298.00 |     286000 |
| Mexico                              |    2515 | Central America         |   1958201.00 |   98881000 |
| Nicaragua                           |    2734 | Central America         |    130000.00 |    5074000 |
| Nepal                               |    2729 | Southern and Central Asia |    147181.00 |   23930000 |
| Pakistan                            |    2831 | Southern and Central Asia |    796095.00 |  156483000 |
| Panama                              |    2882 | Central America         |     75517.00 |    2856000 |
| El Salvador                         |     645 | Central America         |     21041.00 |    6276000 |
| Sao Tome and Principe               |    3172 | Central Africa          |       964.00 |     147000 |
| Chad                                |    3337 | Central Africa          |   1284000.00 |    7651000 |
```

Step 8: Challenge

Write a query to return the **sum of the surface area** and **sum of the population** of North America.

```
MariaDB [(none)]> SELECT SUM(SurfaceArea) AS "N. America Surface Area", SUM(Population)
 AS "N. America Population" FROM world.country WHERE Region = "North America";
+-------------------------+-----------------------+
| N. America Surface Area | N. America Population |
+-------------------------+-----------------------+
|             21500515.00 |             309632000 |
+-------------------------+-----------------------+
1 row in set (0.000 sec)
```

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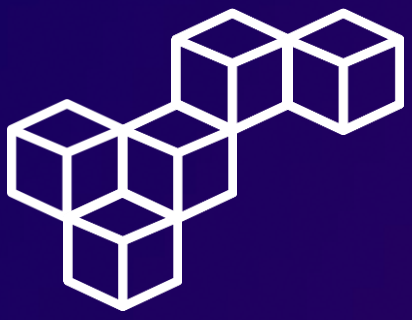

Conclusions

The WHERE clause

The WHERE clause is crucial for filtering data in SQL queries, allowing users to specify conditions that determine which records are included in the query results.

The BETWEEN operator

The BETWEEN operator provides a convenient way to search for data within a specified range, making it useful for date ranges, numeric values, and other scenarios where a range-based search is needed.

The LIKE operator

The LIKE operator, combined with wildcard characters, enables flexible pattern matching in SQL queries, making it easier to search for partial matches or patterns within text data.

The AS operator

The AS operator allows users to create column aliases in query results, providing a more descriptive or meaningful name for a column or expression.

The SUM( ) function

The SUM( ) function is used to calculate the sum of values in a specified column or expression, providing valuable insights into numeric data and supporting aggregation operations in SQL queries.

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