AWS re:Start LAB

Inserting Data in a Database

WEEK 7

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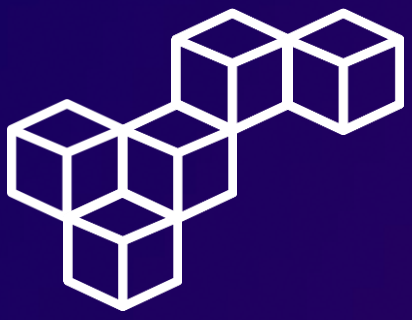


Overview

In managing a database, essential tasks revolve around inserting, updating, and deleting rows within tables. Inserting rows involves adding new data to expand the database's content, ensuring it remains comprehensive and up-to-date. Updating existing rows is crucial for maintaining accuracy by reflecting the latest information and accommodating changes within the database structure. It's a dynamic process that ensures data integrity and relevance.

Deleting rows removes outdated or irrelevant data, streamlining storage and optimizing database performance. This action is key to managing resources efficiently and ensuring that only pertinent information occupies the database. Additionally, importing rows from a database backup file facilitates data recovery and integration, safeguarding against data loss and enabling the database to restore previous states or incorporate external data seamlessly. These operations collectively form the backbone of efficient data management, ensuring databases are accurate, adaptable, and resilient.

Topics covered

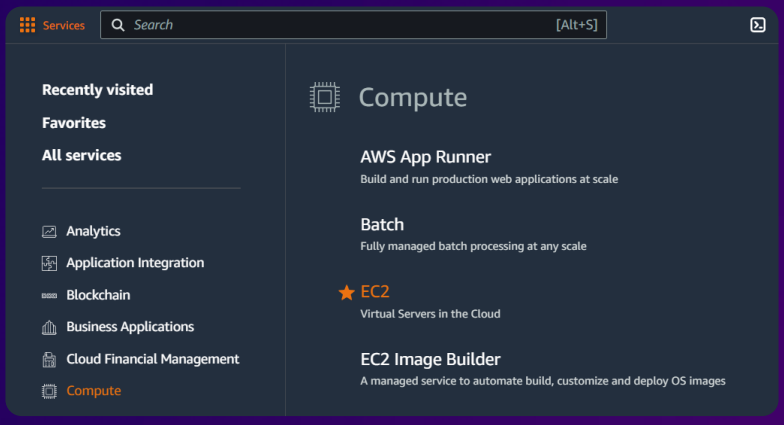
- Insert rows into a table
- Update rows in a table
- Delete rows from a table
- Import rows from a database backup file

Task 1

Connect to a database

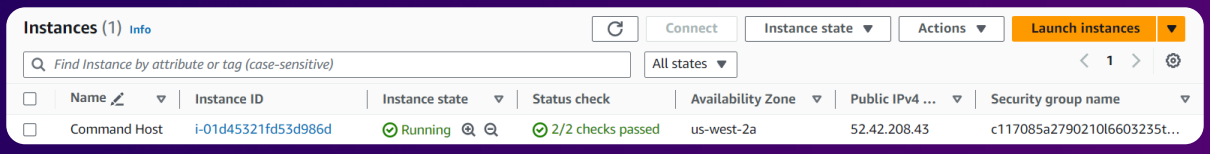
Step 1: Access the EC2 Management Console

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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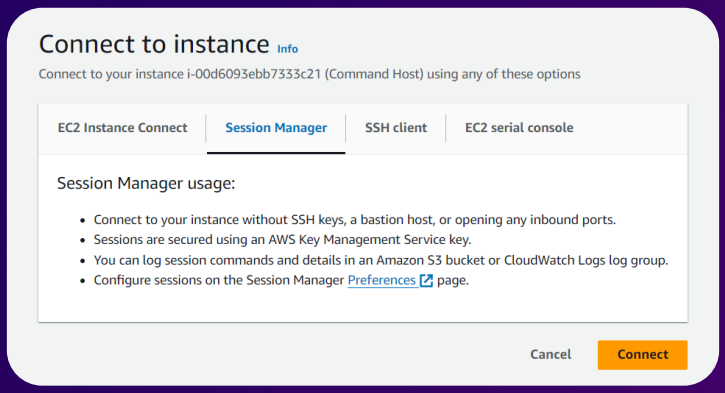
Task 1

Connect to a database

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 relational database

Connect to the relational database instance and show the existing databases.

```
sh-4.2$ sudo su
[root@ip-10-1-11-212 bin]# cd /home/ec2-user/
[root@ip-10-1-11-212 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)]> SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| sys                |
| world              |
+--------------------+
5 rows in set (0.003 sec)
```

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Task 2

Insert data into a table

Insert sample data into a table

Verify that the **country** table is empty and insert sample data into the **country** table.

```
MariaDB [(none)]> SELECT * FROM world.country;
Empty set (0.000 sec)

MariaDB [(none)]> INSERT INTO world.country VALUES ('IRL','Ireland','Europe','British Islands',70273.00,1921,3775100,76.8
,75921.00,73132.00,'Ireland/Éire','Republic',1447,'IE');
Query OK, 1 row affected (0.001 sec)

MariaDB [(none)]> INSERT INTO world.country VALUES ('AUS','Australia','Oceania','Australia and New Zealand',7741220.00
,1901,18886000,79.8,351182.00,392911.00,'Australia','Constitutional Monarchy, Federation',135,'AU');
Query OK, 1 row affected (0.001 sec)
```

Verify data insertion

Verify that two rows were successfully inserted into the **country** table.

```
MariaDB [(none)]> SELECT * FROM world.country;
+------+-----------+-----------+--------------------------+-------------+-----------+------------+---------------+----------+-----------+-----------------------------------+---------+-------+
| Code | Name      | Continent | Region                   | SurfaceArea | IndepYear | Population | LifeExpectancy | GNP      | GNPOld    | LocalName     | GovernmentForm                    | Capital | Code2 |
+------+-----------+-----------+--------------------------+-------------+-----------+------------+---------------+----------+-----------+-----------------------------------+---------+-------+
| AUS  | Australia | Oceania   | Australia and New Zealand |  7741220.00 |      1901 |   18886000 |          79.8 | 351182.00 | 392911.00 | Australia     | Constitutional Monarchy, Federation |     135 | AU    |
| IRL  | Ireland   | Europe    | British Islands          |    70273.00 |      1921 |    3775100 |          76.8 |  75921.00 |  73132.00 | Ireland/Éire  | Republic                          |    1447 | IE    |
+------+-----------+-----------+--------------------------+-------------+-----------+------------+---------------+----------+-----------+-----------------------------------+---------+-------+
2 rows in set (0.000 sec)
```

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Task 3

Update rows in a table

Update one column

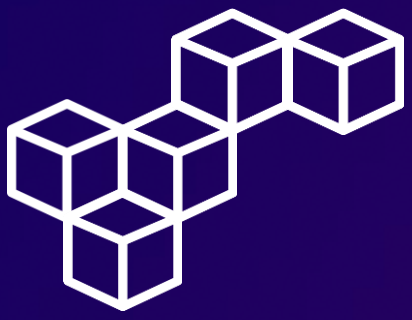
Set the value in the **Population** column to 0 for both rows in the **country** table.

```
MariaDB [(none)]> UPDATE world.country SET Population = 0;
Query OK, 2 rows affected (0.001 sec)
Rows matched: 2  Changed: 2  Warnings: 0

MariaDB [(none)]> SELECT * FROM world.country;
+------+-----------+-----------+--------------------------+-------------+-----------+------------+----------------+-----------+-----------+--------------------------------+---------+-------+
| Code | Name      | Continent | Region                   | SurfaceArea | IndepYear | Population | LifeExpectancy | GNP       | GNPOld    | LocalName      | GovernmentForm                 | Capital | Code2 |
+------+-----------+-----------+--------------------------+-------------+-----------+------------+----------------+-----------+-----------+--------------------------------+---------+-------+
| AUS  | Australia | Oceania   | Australia and New Zealand |  7741220.00 |      1901 |          0 |           79.8 | 351182.00 | 392911.00 | Australia      | Constitutional Monarchy, Federation |     135 | AU    |
| IRL  | Ireland   | Europe    | British Islands          |    70273.00 |      1921 |          0 |           76.8 |  75921.00 |  73132.00 | Ireland/Éire   | Republic                       |    1447 | IE    |
+------+-----------+-----------+--------------------------+-------------+-----------+------------+----------------+-----------+-----------+--------------------------------+---------+-------+
2 rows in set (0.000 sec)
```

Update two columns

Update the **Population** and **SurfaceArea** columns for all rows in the **country** table.

```
MariaDB [(none)]> UPDATE world.country SET Population = 100, SurfaceArea = 100;
Query OK, 2 rows affected (0.001 sec)
Rows matched: 2  Changed: 2  Warnings: 0

MariaDB [(none)]> SELECT * FROM world.country;
+------+-----------+-----------+--------------------------+-------------+-----------+------------+----------------+-----------+-----------+--------------------------------+---------+-------+
| Code | Name      | Continent | Region                   | SurfaceArea | IndepYear | Population | LifeExpectancy | GNP       | GNPOld    | LocalName      | GovernmentForm                 | Capital | Code2 |
+------+-----------+-----------+--------------------------+-------------+-----------+------------+----------------+-----------+-----------+--------------------------------+---------+-------+
| AUS  | Australia | Oceania   | Australia and New Zealand |      100.00 |      1901 |        100 |           79.8 | 351182.00 | 392911.00 | Australia      | Constitutional Monarchy, Federation |     135 | AU    |
| IRL  | Ireland   | Europe    | British Islands          |      100.00 |      1921 |        100 |           76.8 |  75921.00 |  73132.00 | Ireland/Éire   | Republic                       |    1447 | IE    |
+------+-----------+-----------+--------------------------+-------------+-----------+------------+----------------+-----------+-----------+--------------------------------+---------+-------+
2 rows in set (0.000 sec)
```



Task 4

Delete rows from a table

Delete all rows

Delete all rows from the **country** table.

```
MariaDB [(none)]> DELETE FROM world.country;
Query OK, 2 rows affected (0.001 sec)
```

Verify rows deletion

Verify that all rows have been deleted from the **country** table.

```
MariaDB [(none)]> SELECT * FROM world.country;
Empty set (0.000 sec)
```

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Task 5

Import data using an SQL file

Step 1: Check the SQL file

Exit the MySQL terminal and verify that the **world.sql** file has been downloaded.

```
MariaDB [(none)]> QUIT;
Bye
[root@ip-10-1-11-212 ec2-user]# ls /home/ec2-user/world.sql
/home/ec2-user/world.sql
[root@ip-10-1-11-212 ec2-user]#
```

Step 2: Import sample data into a table

Load rows into the **country** table and reconnect to the database.

```
[root@ip-10-1-11-212 ec2-user]# mysql -u root --password='re:St@rt!9' < /home/ec2-user/world.sql
[root@ip-10-1-11-212 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 19
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 5

Import data using an SQL file

Step 3: Verify data import

Verify that the script ran successfully. Observe that there are three tables named **city**, **country**, and **countrylanguage**.

```
MariaDB [(none)]> USE world;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
MariaDB [world]> SHOW TABLES;
+-----------------+
| Tables_in_world |
+-----------------+
| city            |
| country         |
| countrylanguage |
+-----------------+
3 rows in set (0.000 sec)
```

Step 4: Review the country table

Verify that the rows were loaded successfully. Notice that there are more entries in the **country** table.

```
MariaDB [world]> SELECT * FROM country;
+------+-----------------------------------------+---------------+-------------------------+-------------+------------+----------------+-----------+-----------+-----------------------------------------+-----------------------------------+---------+-------+
| Code | Name                                    | Continent     | Region                  | SurfaceArea | IndepYear  | Population     | LifeExpectancy | GNP       | GNPOld    | LocalName                               | GovernmentForm                    | Capital | Code2 |
+------+-----------------------------------------+---------------+-------------------------+-------------+------------+----------------+-----------+-----------+-----------+-----------------------------------------+-----------------------------------+---------+-------+
| ABW  | Aruba                                   | North America | Caribbean               |      193.00 |       NULL |         103000 |      78.4 |    828.00 |    793.00 | Aruba                                   | Nonmetropolitan Territory of The Netherlands |     129 | AW    |
| AFG  | Afghanistan                             | Asia          | Southern and Central Asia |   652090.00 |       1919 |       22720000 |      45.9 |   5976.00 |      NULL | Afganistan/Afqanestan                   | Islamic Emirate                   |       1 | AF    |
| AGO  | Angola                                  | Africa        | Central Africa          |  1246700.00 |       1975 |       12878000 |      38.3 |   6648.00 |   7984.00 | Angola                                  | Republic                          |      56 | AO    |
| AIA  | Anguilla                                | North America | Caribbean               |       96.00 |       NULL |           8000 |      76.1 |     63.20 |      NULL | Anguilla                                | Dependent Territory of the UK     |      62 | AI    |
| ALB  | Albania                                 | Europe        | Southern Europe         |    28748.00 |       1912 |        3401200 |      71.6 |   3205.00 |   2500.00 | Shqipëria                               | Republic                          |      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 |      33 | AN    |
| ARE  | United Arab Emirates                    | Asia          | Middle East             |    83600.00 |       1971 |        2441000 |      74.1 |  37966.00 |  36846.00 | Al-Imarat al-'Arabiya al-Muttahida      | Emirate Federation                |      65 | AE    |
| ARG  | Argentina                               | South America | South America           |  2780400.00 |       1816 |       37032000 |      75.1 |  340238.00 |  323310.00 | Argentina                               | Federal Republic                  |      69 | AR    |
| ARM  | Armenia                                 | Asia          | Middle East             |    29800.00 |       1991 |        3520000 |      66.4 |   1813.00 |   1627.00 | Hajastan                                | Republic                          |     126 | AM    |
| ASM  | American Samoa                          | Oceania       | Polynesia               |      199.00 |       NULL |          68000 |      75.1 |    334.00 |      NULL | Amerika 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              |     7780.00 |       NULL |              0 |      NULL |      0.00 |      NULL | Terres australes françaises             | Nonmetropolitan Territory of France |    NULL | TF    |
| ATG  | Antigua and Barbuda                     | North America | Caribbean               |      442.00 |       1981 |          68000 |      70.5 |    612.00 |    584.00 | Antigua and Barbuda                     | Constitutional Monarchy           |      63 | AG    |
| AUS  | Australia                               | Oceania       | Australia and New Zealand |  7741220.00 |       1901 |       18886000 |      79.8 |  351182.00 |  392911.00 | Australia                               | Constitutional Monarchy, Federation |     135 | AU    |
| AUT  | Austria                                 | Europe        | Western Europe          |    83859.00 |       1918 |        8091800 |      77.7 |  211860.00 |  206025.00 | Österreich                              | Federal Republic                  |    1523 | AT    |
| AZE  | Azerbaijan                              | Asia          | Middle East             |    86600.00 |       1991 |        7734000 |      62.9 |    4127.00 |    4100.00 | Azärbaycan                              | Federal Republic                  |     144 | AZ    |
| BDI  | Burundi                                 | Africa        | Eastern Africa          |    27834.00 |       1962 |        6695000 |      46.2 |     903.00 |     982.00 | Burundi/Uburundi                        | Republic                          |     552 | BI    |
| BEL  | Belgium                                 | Europe        | Western Europe          |    30518.00 |       1830 |       10239000 |      77.8 |  249704.00 |  243948.00 | België/Belgique                         | Constitutional Monarchy, Federation |     179 | BE    |
| BEN  | Benin                                   | Africa        | Western Africa          |   112622.00 |       1960 |        6097000 |      50.2 |    2357.00 |    2141.00 | Bénin                                   | Republic                          |     187 | BJ    |
| BFA  | Burkina Faso                            | Africa        | Western Africa          |   274000.00 |       1960 |       11937000 |      46.7 |    2425.00 |    2201.00 | Burkina Faso                            | Republic                          |     549 | BF    |
| BGD  | Bangladesh                              | Asia          | Southern and Central Asia |   143998.00 |       1971 |      129155000 |      60.2 |   32852.00 |   31966.00 | Bangladesh                              | Republic                          |     150 | BD    |
| BGR  | Bulgaria                                | Europe        | Eastern Europe          |   110994.00 |       1908 |        8190900 |      70.9 |   12178.00 |   10169.00 | Balgarija                               | Republic                          |     539 | BG    |
| BHR  | Bahrain                                 | Asia          | Middle East             |      694.00 |       1971 |         617000 |      73.0 |    6366.00 |    6097.00 | Al-Bahrayn                              | Monarchy (Emirate)                |     149 | BH    |
| BHS  | Bahamas                                 | North America | Caribbean               |    13878.00 |       1973 |         307000 |      71.1 |    3527.00 |    3347.00 | The Bahamas                             | Constitutional Monarchy           |     148 | BS    |
| BIH  | Bosnia and Herzegovina                  | Europe        | Southern Europe         |    51197.00 |       1992 |        3972000 |      71.5 |    2841.00 |      NULL | Bosna i Hercegovina                     | Federal Republic                  |     201 | BA    |
| BLR  | Belarus                                 | Europe        | Eastern Europe          |   207600.00 |       1991 |       10236000 |      68.0 |   12714.00 |      NULL | Belarus                                 | Republic                          |    3520 | BY    |
| BLZ  | Belize                                  | North America | Central America         |    22696.00 |       1981 |         241000 |      70.9 |     630.00 |     616.00 | Belize                                  | Constitutional Monarchy           |     185 | BZ    |
| BMU  | Bermuda                                 | North America | North America           |       53.00 |       NULL |          65000 |      76.9 |    2328.00 |    2190.00 | Bermuda                                 | Dependent Territory of the UK     |     191 | BM    |
| BOL  | Bolivia                                 | South America | South America           |  1098581.00 |       1825 |        8329000 |      63.7 |    8571.00 |    7967.00 | Bolivia                                 | Republic                          |     194 | BO    |
| BRA  | Brasil                                  | South America | South America           |  8547403.00 |       1822 |      170115000 |      62.9 |   776739.00 |  804108.00 | Brasil                                  | Federal Republic                  |     211 | BR    |
```

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Task 5

Import data using an SQL file

Step 5: Review the city table

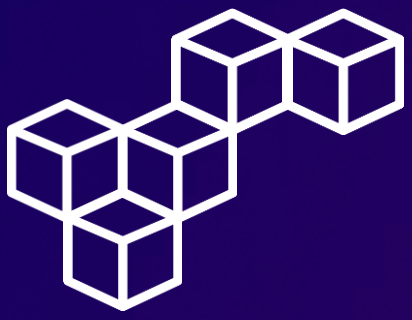
Use the SELECT statement to query the **city** table.

```
MariaDB [world]> SELECT * FROM city;
+------+-----------------------------------+-------------+-----------------------+------------+
| ID   | Name                              | CountryCode | District              | Population |
+------+-----------------------------------+-------------+-----------------------+------------+
|    1 | Kabul                             | AFG         | Kabol                 |    1780000 |
|    2 | Qandahar                          | AFG         | Qandahar              |     237500 |
|    3 | Herat                             | AFG         | Herat                 |     186800 |
|    4 | Mazar-e-Sharif                    | AFG         | Balkh                 |     127800 |
|    5 | Amsterdam                         | NLD         | Noord-Holland         |     731200 |
|    6 | Rotterdam                         | NLD         | Zuid-Holland          |     593321 |
|    7 | Haag                              | NLD         | Zuid-Holland          |     440900 |
|    8 | Utrecht                           | NLD         | Utrecht               |     234323 |
|    9 | Eindhoven                         | NLD         | Noord-Brabant         |     201843 |
|   10 | Tilburg                           | NLD         | Noord-Brabant         |     193238 |
|   11 | Groningen                         | NLD         | Groningen             |     172701 |
|   12 | Breda                             | NLD         | Noord-Brabant         |     160398 |
|   13 | Apeldoorn                         | NLD         | Gelderland            |     153491 |
|   14 | Nijmegen                          | NLD         | Gelderland            |     152463 |
|   15 | Enschede                          | NLD         | Overijssel            |     149544 |
|   16 | Haarlem                           | NLD         | Noord-Holland         |     148772 |
|   17 | Almere                            | NLD         | Flevoland             |     142465 |
```

Step 6: Review the countrylanguage table

Use the SELECT statement to query the **countrylanguage** table.

```
MariaDB [world]> SELECT * FROM countrylanguage;
+-------------+--------------------------+------------+------------+
| CountryCode | Language                 | IsOfficial | Percentage |
+-------------+--------------------------+------------+------------+
| ABW         | Dutch                    | T          |        5.3 |
| ABW         | English                  | F          |        9.5 |
| ABW         | Papiamento               | F          |       76.7 |
| ABW         | Spanish                  | F          |        7.4 |
| AFG         | Balochi                  | F          |        0.9 |
| AFG         | Dari                     | T          |       32.1 |
| AFG         | Pashto                   | T          |       52.4 |
| AFG         | Turkmenian               | F          |        1.9 |
| AFG         | Uzbek                    | F          |        8.8 |
| AGO         | Ambo                     | F          |        2.4 |
| AGO         | Chokwe                   | F          |        4.2 |
| AGO         | Kongo                    | F          |       13.2 |
| AGO         | Luchazi                  | F          |        2.4 |
| AGO         | Luimbe-nganguela         | F          |        5.4 |
| AGO         | Luvale                   | F          |        3.6 |
| AGO         | Mbundu                   | F          |       21.6 |
| AGO         | Nyaneka-nkhumbi          | F          |        5.4 |
```



Conclusions

Inserting data
Inserting data is essential for adding new information into a database, ensuring it remains up-to-date and comprehensive.

The INSERT statement
The INSERT statement in SQL is used to add new rows of data into a table, providing a structured way to input information into the database.

The UPDATE statement
The UPDATE statement allows for modifications to existing data in a database, ensuring that records reflect the most recent and accurate information.

The DELETE statement
The DELETE statement is crucial for removing specific data rows from a table, helping to manage database content and optimize storage.

Importing data
Importing data involves bringing external data into a database, facilitating data integration and enabling the incorporation of data from various sources for analysis and storage.

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Cristhian Becerra

cristhian-becerra-espinoza

+51 951 634 354

cristhianbecerra99@gmail.com

Lima, Peru