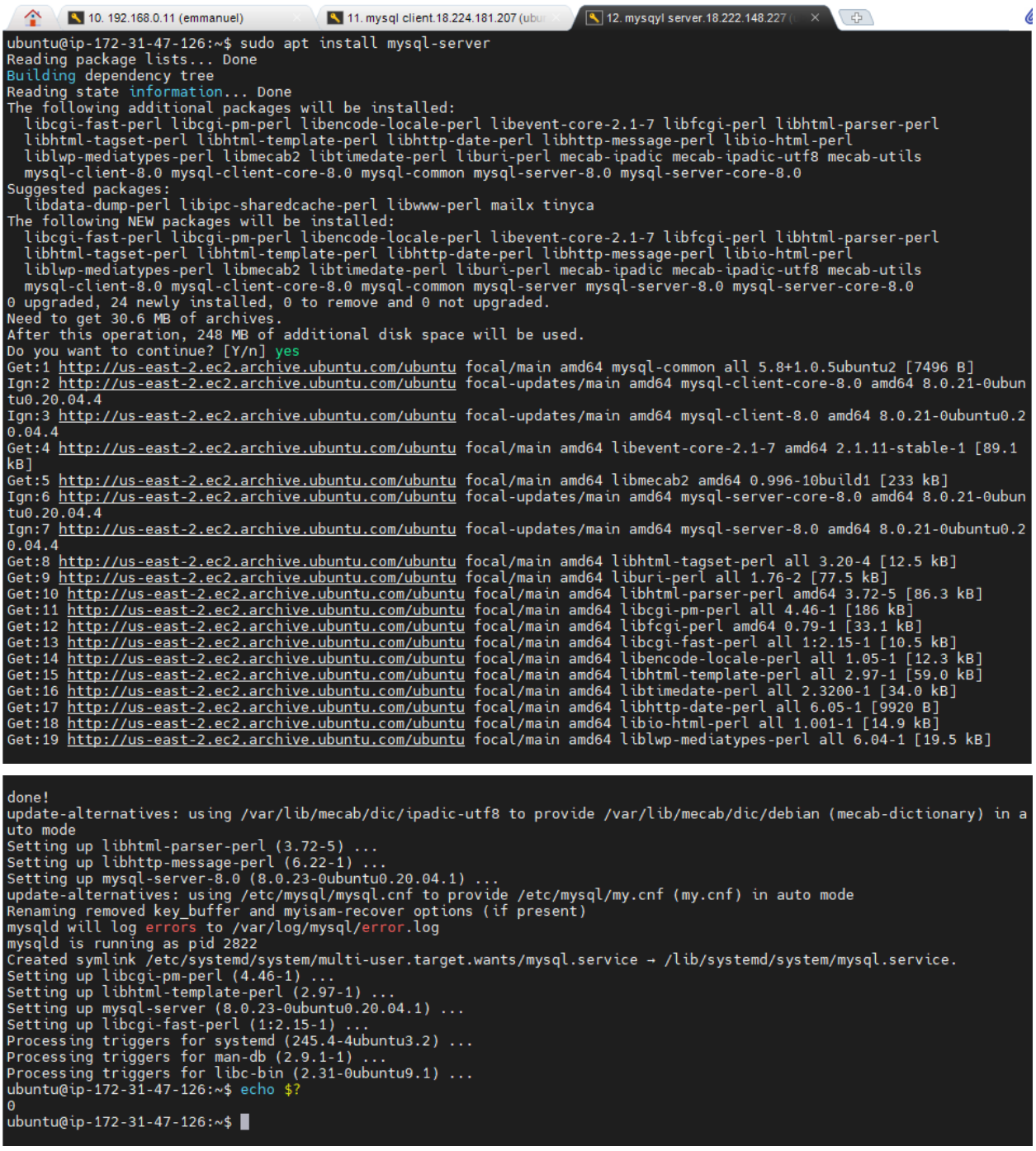
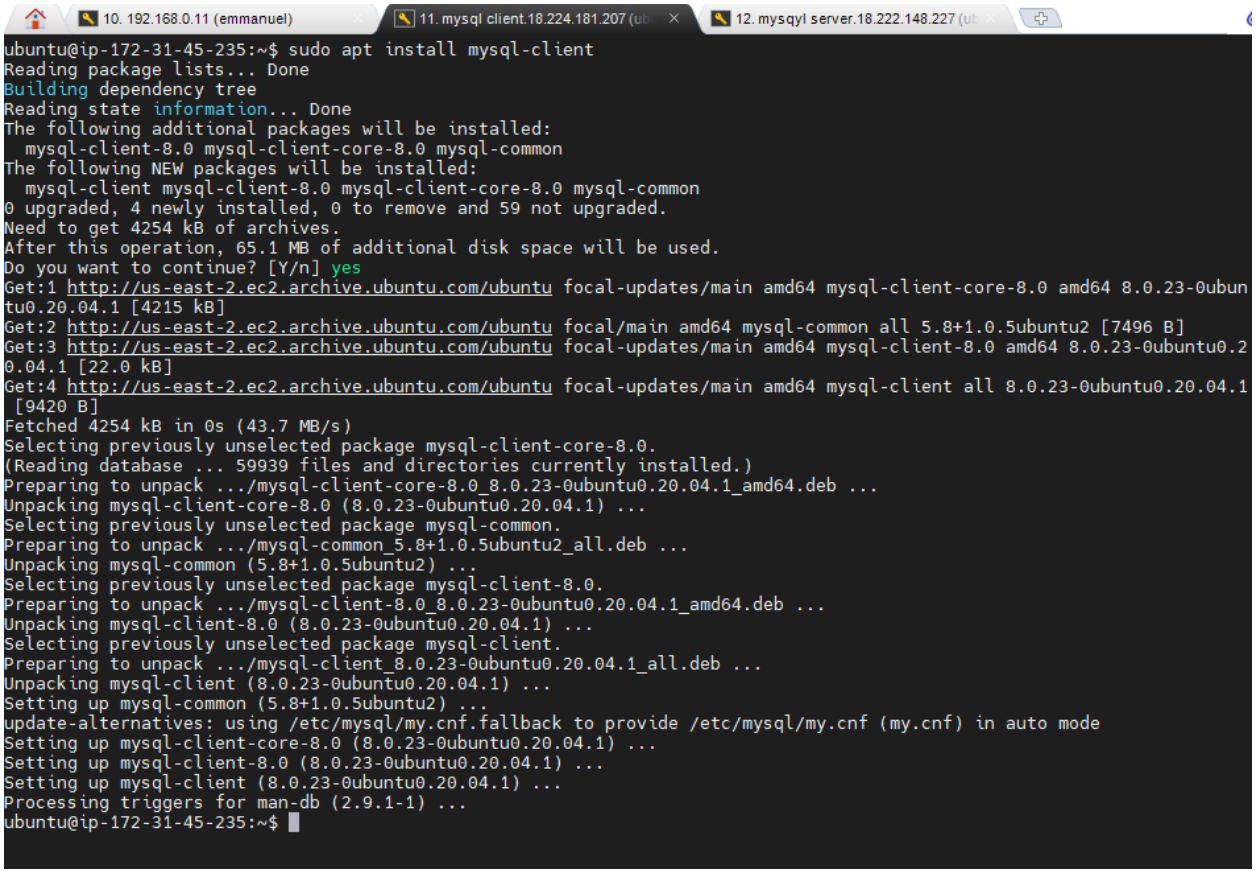
TASK - Implement a Client Server Architecture using MySQL Database Management System (DBMS)

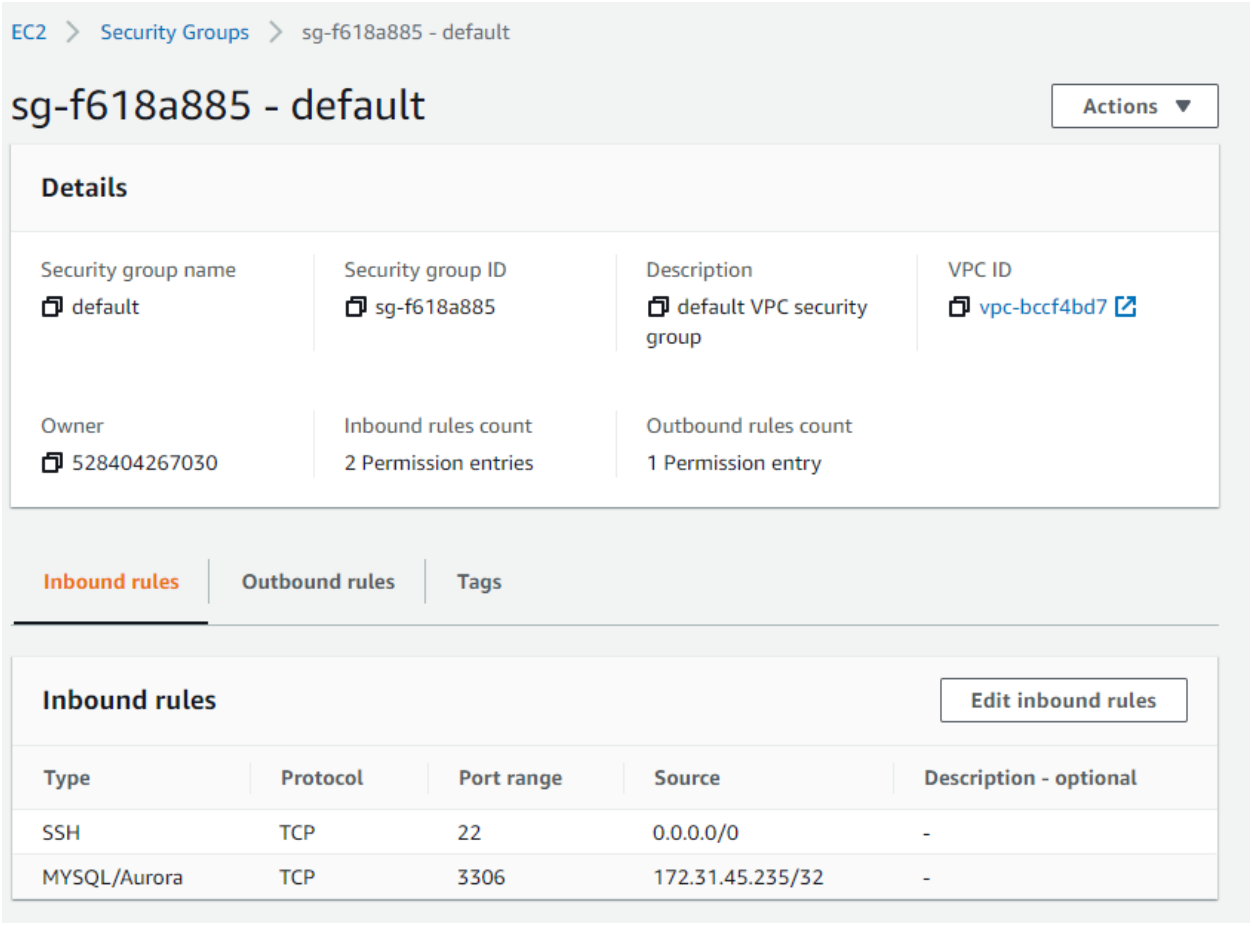
1. On mysql server Linux Server install MySQL Server software.



2. On mysql client Linux Server install MySQL Client software.

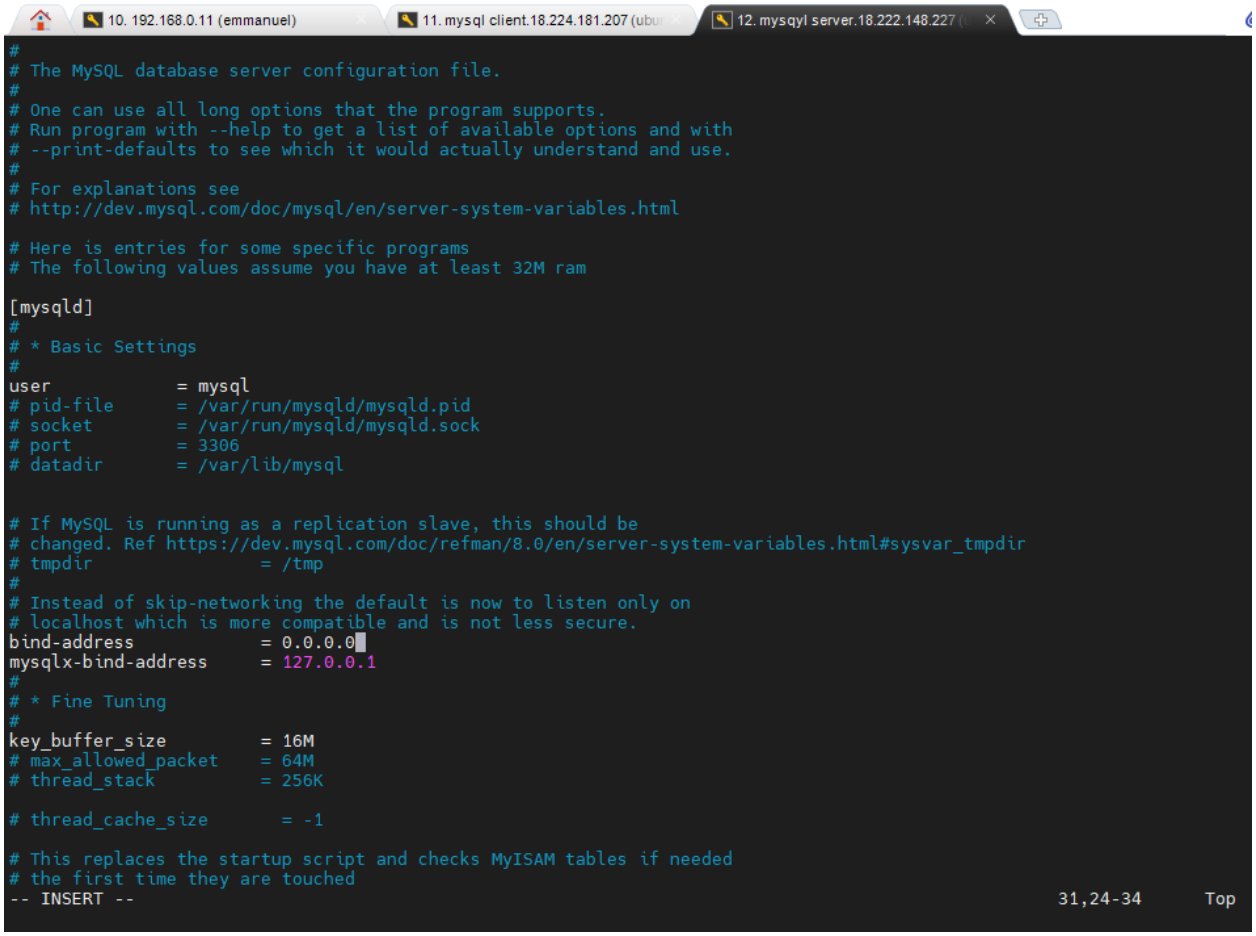


2. create a new entry in ‘Inbound rules’ in ‘mysql server’ Security Groups allowing access only to the specific local IP address of your ‘mysql client’.

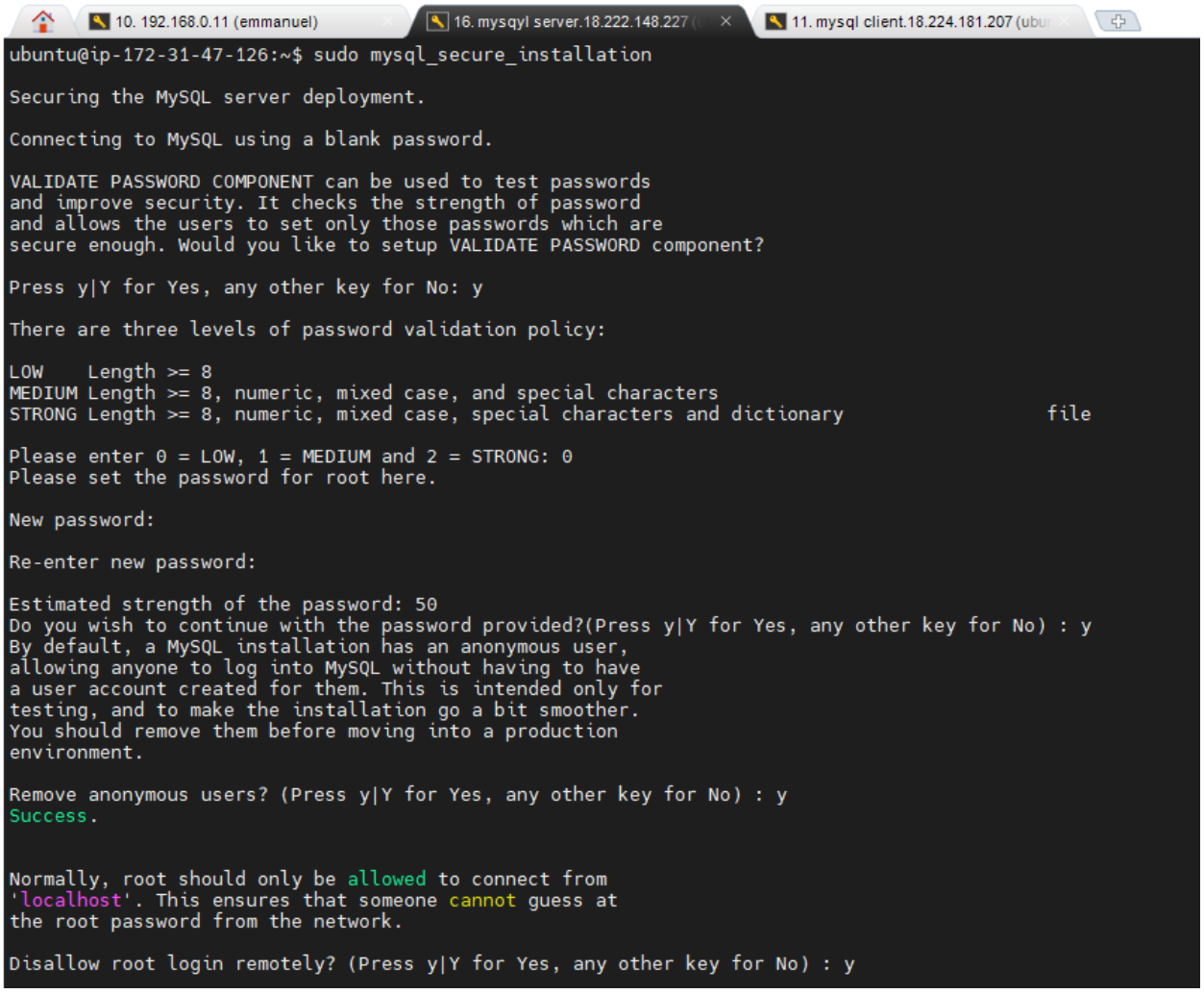


3. Configure MySQL server to allow connections from remote hosts.

```
ubuntu@ip-172-31-47-126:~$ sudo vi /etc/mysql/mysql.conf.d/mysqld.cnf
ubuntu@ip-172-31-47-126:~$
```



4. Securing mysql installation



5. Starting mysql

```
ubuntu@ip-172-31-25-28:~$ sudo mysql
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 12
Server version: 8.0.23-0ubuntu0.20.04.1 (Ubuntu)

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owners.

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

mysql> CREATE USER 'emmanuel'@'%' IDENTIFIED BY 'sql12345';
Query OK, 0 rows affected (0.02 sec)

mysql> GRANT ALL ON *.* TO 'emmanuel'@'%';
Query OK, 0 rows affected (0.00 sec)

mysql> CREATE DATABASE project5'
    '>
    '>

^C
mysql> CREATE DATABASE project5;
Query OK, 1 row affected (0.03 sec)

mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| project5           |
| sys                |
+--------------------+
5 rows in set (0.01 sec)

mysql> quit
Bye
ubuntu@ip-172-31-25-28:~$
```

6. Connecting to mysql server from mysql client

```
Last login: Mon Feb 22 18:39:43 2021 from 73.152.119.181
ubuntu@ip-172-31-45-235:~$ sudo mysql -u 172.31.45.235 -p -h 172.31.47.126
Enter password:
ERROR 1130 (HY000): Host 'ip-172-31-45-235.us-east-2.compute.internal' is not allowed to connect to this MySQL server
ubuntu@ip-172-31-45-235:~$ sudo mysql -u 172.31.45.235 -p -h 172.31.47.126
Enter password:
ERROR 1130 (HY000): Host 'ip-172-31-45-235.us-east-2.compute.internal' is not allowed to connect to this MySQL server
ubuntu@ip-172-31-45-235:~$ mysql -u 172.31.45.235 -p -h 172.31.47.126
Enter password:
ERROR 1130 (HY000): Host 'ip-172-31-45-235.us-east-2.compute.internal' is not allowed to connect to this MySQL server
ubuntu@ip-172-31-45-235:~$
```

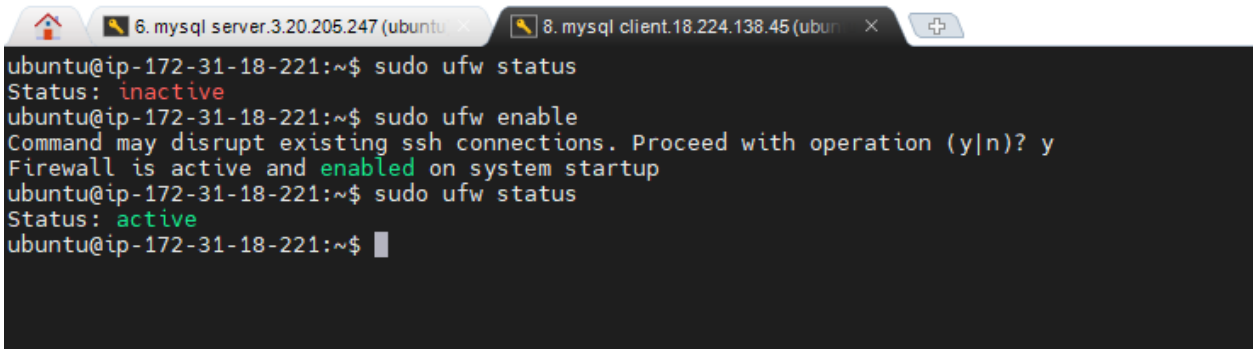
Further actions to solve the issue above

6a. Enabling firewalls on both server and client

```
ubuntu@ip-172-31-25-28:~$ sudo ufw enable
Command may disrupt existing ssh connections. Proceed with operation (y|n)? y
Firewall is active and enabled on system startup
ubuntu@ip-172-31-25-28:~$ sudo ufw status
Status: active
ubuntu@ip-172-31-25-28:~$ sudo ufw allow 3306
Rule added
Rule added (v6)
ubuntu@ip-172-31-25-28:~$ sudo ufw status
Status: active

To                         Action      From
--                         ------      ----
3306                       ALLOW       Anywhere
3306 (v6)                  ALLOW       Anywhere (v6)

ubuntu@ip-172-31-25-28:~$
```



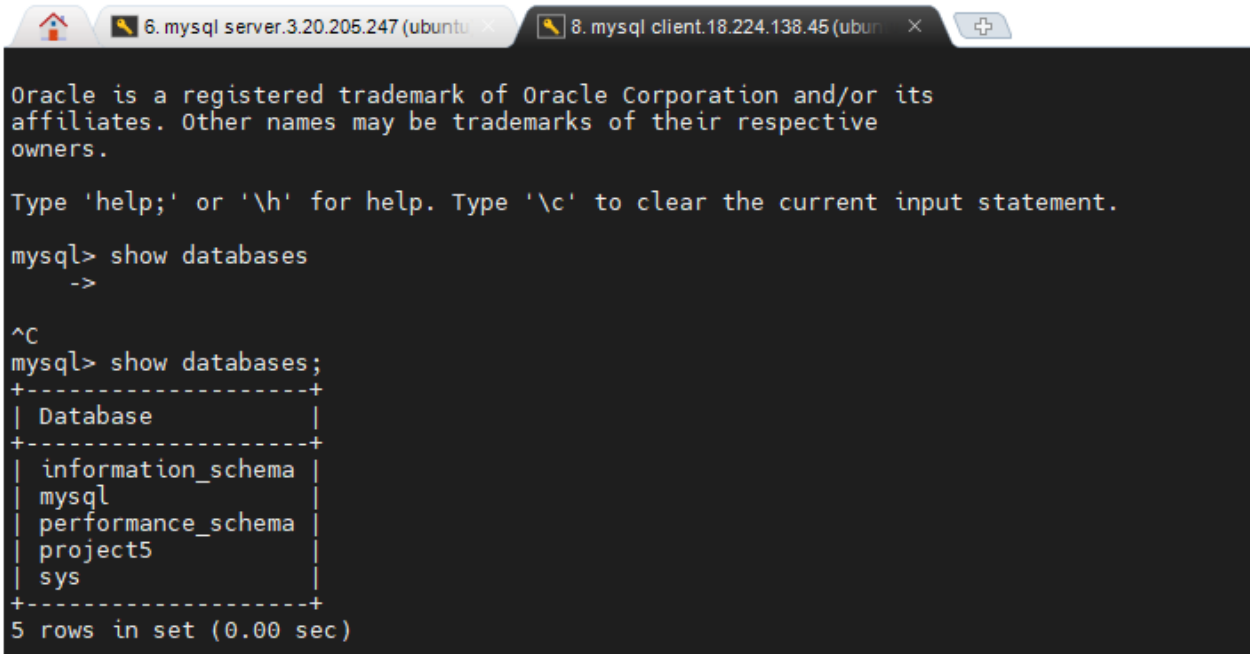
6b. Restarting mysql service

```
ubuntu@ip-172-31-25-28:~$ sudo service mysql restart
```

6c. Setting security group on mysql server to allow access from anywhere

6d. Connecting to mysql server from mysql client after allowing access from anywhere

$ Mysql -h 172.31.25.28 -u emmanuel -p



The connection was successful as shown above, however, after I went back to revert the security groups from all traffic, I lost connection to my terminals for both client and server sides. I will research further.

Summary
This project further broadened my scope and understanding of client-server architecture using mysql RDBMS.

Resources
https://linuxize.com/post/how-to-create-mysql-user-accounts-and-grant-privileges/#:~:text=A%20user%20account%20in%20MySQL,user_password%20with%20the%20user%20password.

https://cloud.google.com/solutions/mysql-remote-access

https://linuxconfig.org/error-2003-hy000-can-t-connect-to-mysql-server-on-111-solution

https://www.digitalocean.com/community/tutorials/how-to-allow-remote-access-to-mysql

In computing, `traceroute` and `tracert` are computer network diagnostic commands for displaying possible routes (paths) and measuring transit delays of packets across an Internet Protocol (IP) network.

Ping is a computer network administration software utility used to test the reachability of a host on an Internet Protocol (IP) network. It is available for virtually all operating systems that have networking capability, including most embedded network administration software.

Ping measures the round-trip time for messages sent from the originating host to a destination computer that are echoed back to the source. The name comes from active sonar terminology that sends a pulse of sound and listens for the echo to detect objects under water.[1]