

## Task 4.1

### Part 1

#### 1. Install MySQL on VM

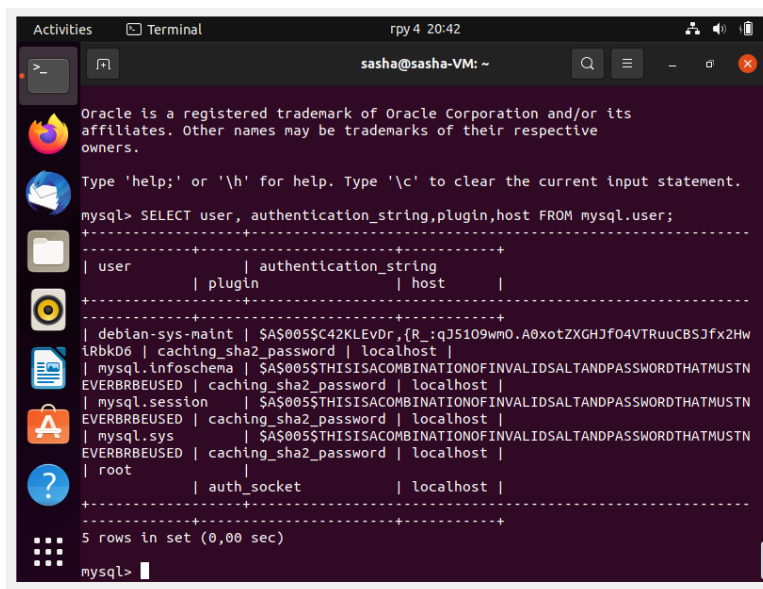
`sudo apt update`

`sudo apt install mysql-server`

`sudo mysql_secure_installation`

`sudo mysql`

`SELECT user,authentication_string,plugin,host FROM mysql.user;`



```
Activities Terminal rpy 4 20:42 sasha@sasha-VM: ~
Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
mysql> SELECT user, authentication_string, plugin, host FROM mysql.user;
+-----+-----+-----+-----+
| user                | authentication_string | plugin | host |
+-----+-----+-----+-----+
| debian-sys-maint    | $A$005$C42KLEvDr,{R_:qJ5109wm0.A0xotZXGHJf04VTRuucB5Jfx2Hw |
iRbkD6 | caching_sha2_password | localhost |
| mysql.infoschema    | $A$005$THISISACOMBINATIONOFINVALIDSALTANDPASSWORDTHATMUSTN |
EVERBRBEUSED | caching_sha2_password | localhost |
| mysql.session       | $A$005$THISISACOMBINATIONOFINVALIDSALTANDPASSWORDTHATMUSTN |
EVERBRBEUSED | caching_sha2_password | localhost |
| mysql.sys           | $A$005$THISISACOMBINATIONOFINVALIDSALTANDPASSWORDTHATMUSTN |
EVERBRBEUSED | caching_sha2_password | localhost |
| root                |                       | auth_socket | localhost |
+-----+-----+-----+-----+
5 rows in set (0.00 sec)
mysql>
```

`ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY 'Zxc12345!';`

`FLUSH PRIVILEGES;`

`SELECT user,authentication_string,plugin,host FROM mysql.user;`

```
Ubuntu [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

Activities Terminal rpy 5 17:17
sasha@sasha-VM: ~

Zxc12345!';
Query OK, 0 rows affected (0,37 sec)

mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0,31 sec)

mysql> SELECT user,authentication_string,plugin,host FROM mysql.user;
+-----+-----+-----+-----+
| user          | authentication_string | plugin | host |
+-----+-----+-----+-----+
| debian-sys-maint | $A$005$C42KLEvDr,{R_:qJ5109wm0.A0xotZXGHJf04VTRuuCBSJfx2Hw | |
| caching_sha2_password | localhost |
| mysql.infoschema | $A$005$THISISACOMBINATIONOFINVALIDSALTANDPASSWORDTHATMUSTN |
| EVERBRBEUSED | caching_sha2_password | localhost |
| mysql.session | $A$005$THISISACOMBINATIONOFINVALIDSALTANDPASSWORDTHATMUSTN |
| EVERBRBEUSED | caching_sha2_password | localhost |
| mysql.sys | $A$005$THISISACOMBINATIONOFINVALIDSALTANDPASSWORDTHATMUSTN |
| EVERBRBEUSED | caching_sha2_password | localhost |
| root | $A$005$M6N?F]-H\pZ! |
| _D/Dfa20NxohI0gUhlUa/6FCGP1nF4rD/KEjuE |
| DHSn6/ | caching_sha2_password | localhost |
+-----+-----+-----+-----+
5 rows in set (0,00 sec)

mysql>
```

CREATE USER 'sasha'@'localhost' IDENTIFIED BY 'Asd12345!';

GRANT ALL PRIVILEGES ON \*.\* TO 'sasha'@'localhost' WITH GRANT OPTION;

FLUSH PRIVILEGES;

Exit;

systemctl status mysql.service

```
Ubuntu [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

Activities Terminal rpy 5 17:29
sasha@sasha-VM: ~

sasha@sasha-VM: ~$ systemctl status mysql.service
Command 'systemctli' not found, did you mean:
  command 'systemctl' from deb systemd (248.3-1ubuntu1)
  command 'systemctl' from deb systemctl (1.4.4181-1.1)
Try: sudo apt install <deb name>
sasha@sasha-VM: ~$ systemctl status mysql.service
● mysql.service - MySQL Community Server
   Loaded: loaded (/lib/systemd/system/mysql.service; enabled; vendor preset:
   Active: active (running) since Sat 2021-12-04 20:35:24 EET; 20h ago
     Main PID: 20537 (mysqld)
       Status: "Server is operational"
        Tasks: 40 (limit: 4651)
       Memory: 349.2M
         CPU: 22.129s
      CGroup: /system.slice/mysql.service
             └─20537 /usr/sbin/mysqld

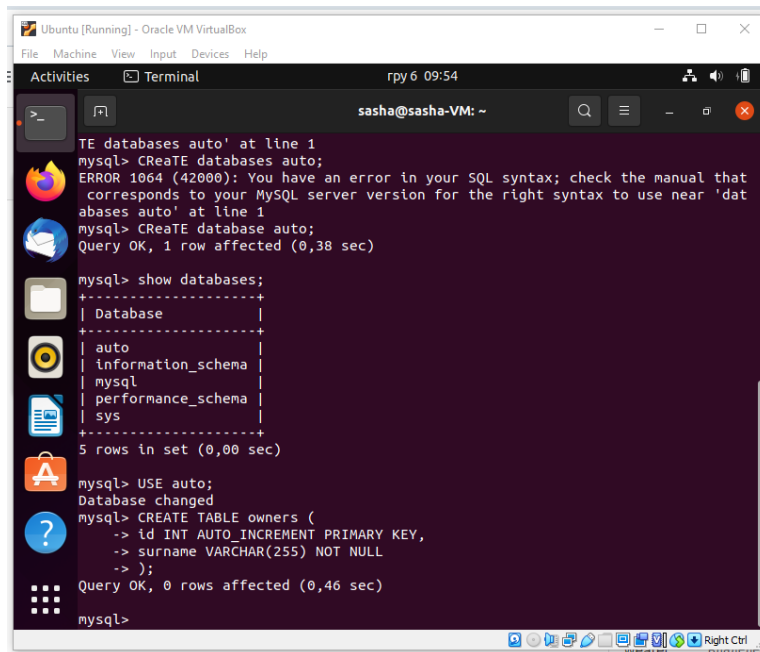
rpy 04 20:35:21 sasha-VM systemd[1]: Starting MySQL Community Server...
rpy 04 20:35:24 sasha-VM systemd[1]: Started MySQL Community Server.
lines 1-13/13 (END)
```

## 2. Create database, and tables

mysql -u root -p

CREATE DATABASE auto;

USE auto;



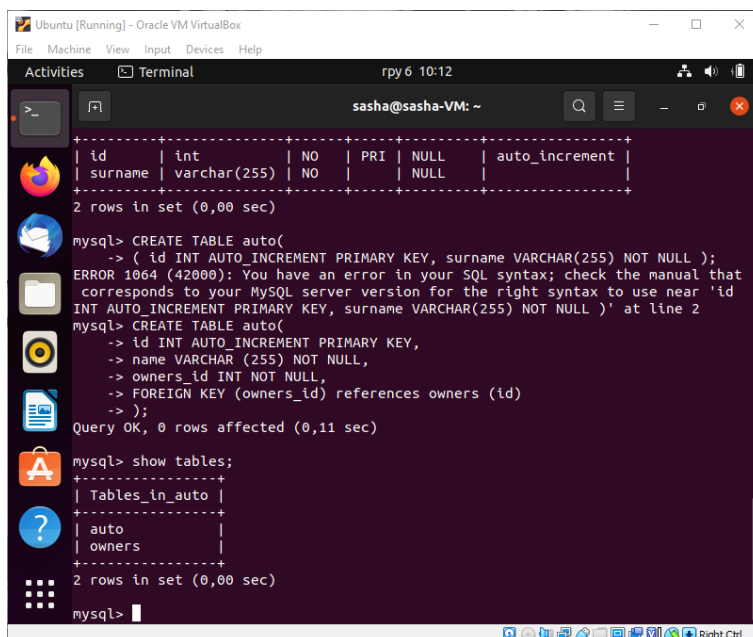
The screenshot shows a terminal window titled 'Ubuntu [Running] - Oracle VM VirtualBox' with a menu bar (File, Machine, View, Input, Devices, Help) and a status bar (rpy 6 09:54). The terminal prompt is 'sasha@sasha-VM: ~'. The user enters the command 'mysql' and is prompted for a password. After logging in, they enter 'CREATE DATABASE auto;'. The output shows an error: 'ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near 'databases auto' at line 1'. The user corrects the command to 'CREATE database auto;'. The output shows 'Query OK, 1 row affected (0,38 sec)'. Then, they enter 'show databases;'. The output shows a list of databases: 'Database', 'auto', 'information\_schema', 'mysql', 'performance\_schema', 'sys'. The user then enters 'USE auto;'. The output shows 'Database changed'. Finally, they enter 'CREATE TABLE owners (''. The output shows 'Query OK, 0 rows affected (0,46 sec)'.

```
mysql> CREATE DATABASES auto;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that
corresponds to your MySQL server version for the right syntax to use near 'dat
abases auto' at line 1
mysql> CREATE database auto;
Query OK, 1 row affected (0,38 sec)

mysql> show databases;
+-----+
| Database |
+-----+
| auto     |
| information_schema |
| mysql    |
| performance_schema |
| sys      |
+-----+
5 rows in set (0,00 sec)

mysql> USE auto;
Database changed
mysql> CREATE TABLE owners (
-> id INT AUTO_INCREMENT PRIMARY KEY,
-> surname VARCHAR(255) NOT NULL
-> );
Query OK, 0 rows affected (0,46 sec)

mysql>
```



The screenshot shows a terminal window titled 'Ubuntu [Running] - Oracle VM VirtualBox' with a menu bar (File, Machine, View, Input, Devices, Help) and a status bar (rpy 6 10:12). The terminal prompt is 'sasha@sasha-VM: ~'. The user enters 'mysql' and is prompted for a password. After logging in, they enter 'CREATE TABLE auto(''. The output shows an error: 'ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near 'id INT AUTO\_INCREMENT PRIMARY KEY, surname VARCHAR(255) NOT NULL)' at line 2'. The user corrects the command to 'CREATE TABLE auto(''. The output shows 'Query OK, 0 rows affected (0,11 sec)'. Then, they enter 'show tables;'. The output shows a list of tables: 'Tables\_in\_auto', 'auto', 'owners'. The user then enters 'mysql>'.

```
mysql> CREATE TABLE auto(
-> ( id INT AUTO_INCREMENT PRIMARY KEY, surname VARCHAR(255) NOT NULL );
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that
corresponds to your MySQL server version for the right syntax to use near 'id
INT AUTO_INCREMENT PRIMARY KEY, surname VARCHAR(255) NOT NULL )' at line 2
mysql> CREATE TABLE auto(
-> id INT AUTO_INCREMENT PRIMARY KEY,
-> name VARCHAR (255) NOT NULL,
-> owners_id INT NOT NULL,
-> FOREIGN KEY (owners_id) references owners (id)
-> );
Query OK, 0 rows affected (0,11 sec)

mysql> show tables;
+-----+
| Tables_in_auto |
+-----+
| auto           |
| owners         |
+-----+
2 rows in set (0,00 sec)

mysql>
```

```
Ubuntu [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal rpy 6 11:21
sasha@sasha-VM: ~
+-----+
7 rows in set (0,00 sec)

mysql> CREATE TABLE port(
-> id INT auto_INCREMENT PRIMARY KEY,
-> port VARCHAR (10) NOT NULL,
-> owners_id INT NOT NULL,
-> FOREIGN KEY (owners_id) referens owners(id)
-> );
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that
corresponds to your MySQL server version for the right syntax to use near 'ref
erens owners(id)
)' at line 5
mysql> CREATE TABLE port( id INT auto_INCREMENT PRIMARY KEY, port VARCHAR (10)
NOT NULL, owners_id INT NOT NULL, FOREIGN KEY (owners_id) references owners(id)
);
Query OK, 0 rows affected (0,42 sec)

mysql> show tables;
+-----+
| Tables_in_auto |
+-----+
| auto            |
| owners          |
| port            |
+-----+
3 rows in set (0,00 sec)

mysql>
```

```
Ubuntu [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal rpy 6 11:40
sasha@sasha-VM: ~
+-----+
7 rows in set (0,00 sec)

mysql> SELECT * FROM port
-> ;
+-----+
| id | port | owners_id |
+-----+
| 1  | CA  | 1         |
| 2  | NJ  | 1         |
| 3  | CA  | 1         |
| 4  | TX  | 2         |
| 5  | TX  | 3         |
| 6  | NJ  | 3         |
| 7  | CA  | 4         |
+-----+
7 rows in set (0,00 sec)

mysql> SELECT * FROM owners where id>2
-> ;
+-----+
| id | surname | age |
+-----+
| 3  | Ganga   | 41  |
| 4  | Slipcow | 30  |
+-----+
2 rows in set (0,00 sec)

mysql>
```

```
Ubuntu [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal rpy 6 11:47
sasha@sasha-VM: ~
contains nonaggregated column 'auto.owners.id' which is not functionally depend
ent on columns in GROUP BY clause; this is incompatible with sql_mode=only_full
_group_by
mysql> SELECT * FROM owners ORDER BY age;
+-----+
| id | surname | age |
+-----+
| 1 | Zui | 29 |
| 2 | Hyrin | 29 |
| 4 | Slipcow | 30 |
| 3 | Ganga | 41 |
+-----+
4 rows in set (0,00 sec)

mysql> SELECT * FROM auto GROUP BY id;
+-----+
| id | name | owners_id | year |
+-----+
| 1 | Ford | 1 | 2018 |
| 2 | Mitsubishi | 1 | 2017 |
| 3 | Jeep | 1 | 2016 |
| 4 | VW | 2 | 2017 |
| 5 | VW | 3 | 2015 |
| 6 | Mitsubishi | 3 | 2020 |
| 7 | Jeep | 4 | 2019 |
+-----+
7 rows in set (0,00 sec)

mysql>
```

### 3. Create new users

CREATE USER 'Vasya'@'localhost' IDENTIFIED BY 'Qwe12345!';  
GRANT ALL PRIVILEGES ON \* . \* TO 'Vasya'@'localhost';  
FLUSH PRIVILEGES;

```
Ubuntu [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal rpy 6 11:58
sasha@sasha-VM: ~
| 4 | Slipcow | 30 |
| 3 | Ganga | 41 |
+-----+
4 rows in set (0,00 sec)

mysql> SELECT * FROM auto GROUP BY id;
+-----+
| id | name | owners_id | year |
+-----+
| 1 | Ford | 1 | 2018 |
| 2 | Mitsubishi | 1 | 2017 |
| 3 | Jeep | 1 | 2016 |
| 4 | VW | 2 | 2017 |
| 5 | VW | 3 | 2015 |
| 6 | Mitsubishi | 3 | 2020 |
| 7 | Jeep | 4 | 2019 |
+-----+
7 rows in set (0,00 sec)

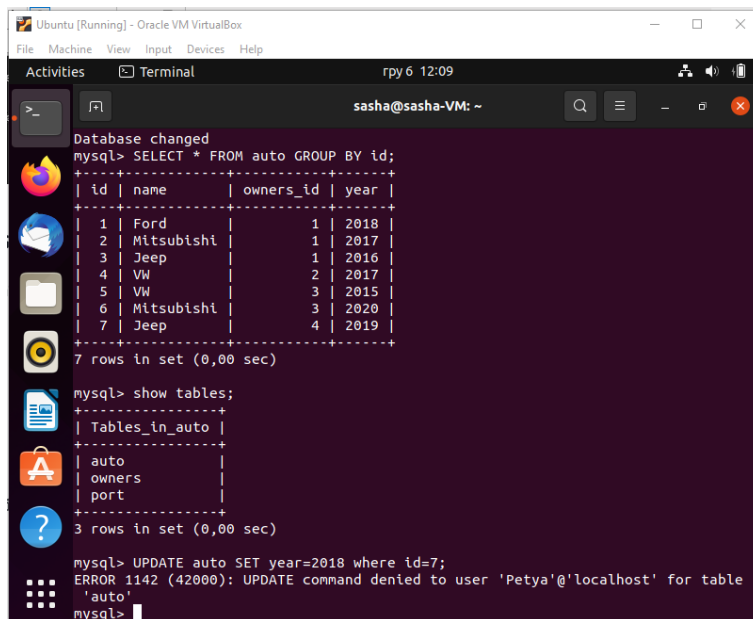
mysql> CREATE USER 'Vasya'@'localhost' IDENTIFIED BY 'Qwe12345!';
Query OK, 0 rows affected (0,05 sec)

mysql> GRANT ALL PRIVILEGES ON *.* TO 'Vasya'@'localhost';
Query OK, 0 rows affected (0,43 sec)

mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0,06 sec)

mysql>
```

```
CREATE USER 'Petya'@'localhost' IDENTIFIED BY 'Qwe123456!';  
GRANT SELECT ON * . * TO 'Petya'@'localhost';  
FLUSH PRIVILEGES;
```

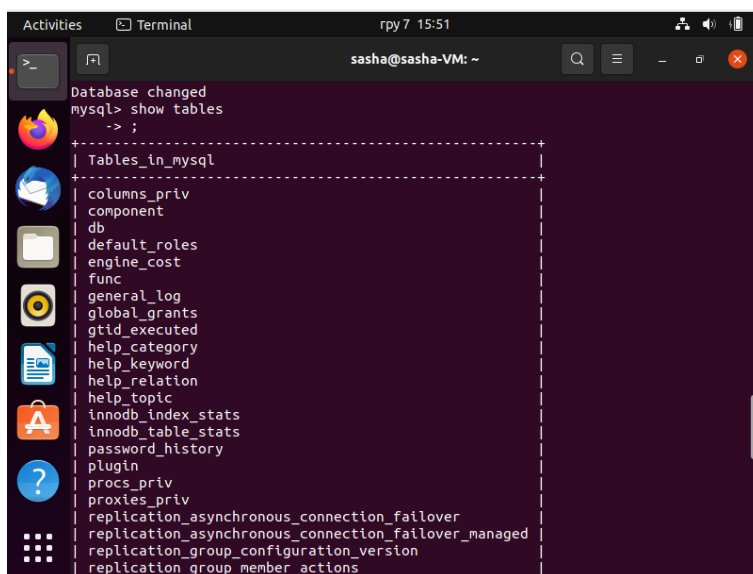


The screenshot shows a terminal window titled 'Ubuntu [Running] - Oracle VM VirtualBox' with a terminal application running. The user is 'sasha@sasha-VM: ~'. The terminal shows the following commands and output:

```
Database changed  
mysql> SELECT * FROM auto GROUP BY id;  
+-----+  
| id | name      | owners_id | year |  
+-----+  
| 1 | Ford      | 1         | 2018 |  
| 2 | Mitsubishi| 1         | 2017 |  
| 3 | Jeep      | 1         | 2016 |  
| 4 | VW        | 2         | 2017 |  
| 5 | VW        | 3         | 2015 |  
| 6 | Mitsubishi| 3         | 2020 |  
| 7 | Jeep      | 4         | 2019 |  
+-----+  
7 rows in set (0,00 sec)  
  
mysql> show tables;  
+-----+  
| Tables_in_auto |  
+-----+  
| auto            |  
| owners          |  
| port            |  
+-----+  
3 rows in set (0,00 sec)  
  
mysql> UPDATE auto SET year=2018 where id=7;  
ERROR 1142 (42000): UPDATE command denied to user 'Petya'@'localhost' for table  
'auto'  
mysql>
```

use mysql

show tables;



The screenshot shows a terminal window titled 'Activities' with a terminal application running. The user is 'sasha@sasha-VM: ~'. The terminal shows the following commands and output:

```
Database changed  
mysql> show tables  
-> ;  
+-----+  
| Tables_in_mysql |  
+-----+  
| columns_priv    |  
| component       |  
| db              |  
| default_roles   |  
| engine_cost     |  
| func            |  
| general_log     |  
| global_grants   |  
| gtid_executed   |  
| help_category   |  
| help_keyword    |  
| help_relation   |  
| help_topic      |  
| innodb_index_stats |  
| innodb_table_stats |  
| password_history |  
| plugin          |  
| procs_priv      |  
| proxies_priv    |  
| replication_asynchronous_connection_failover |  
| replication_asynchronous_connection_failover_managed |  
| replication_group_configuration_version |  
| replication_group_member_actions |  
+-----+
```

```
SELECT user,authentication_string,plugin,host FROM mysql.user;
```

```

sasha@sasha-VM: ~
+-----+
| user | authentication_string | plugin | host |
+-----+
| Petya | $A$005$7*,w(iroXn?`MN1erQF8i.xlSmGcdgyQ0sKH38B/9o1bw3jFngh
| liJB | caching_sha2_password | localhost |
| Vasya | $A$005$1X+J6k!E)@M`Uoe*7Ov/y3ND4Tinqw8qY095K05NsTGBvzjUmc9
| aym9BgwC | caching_sha2_password | localhost |
| debian-sys-maint | $A$005$C42KLEvDr,(R:qJ5109wm0.A0xotZXGHJf04VTRuuCBSJfx2Hw
| iRbkD6 | caching_sha2_password | localhost |
| mysql.infoschema | $A$005$THISISACOMBINATIONOFINVALIDSALTANDPASSWORDTHATMUSTN
| EVERBRBEUSED | caching_sha2_password | localhost |
| mysql.session | $A$005$THISISACOMBINATIONOFINVALIDSALTANDPASSWORDTHATMUSTN
| EVERBRBEUSED | caching_sha2_password | localhost |
| mysql.sys | $A$005$THISISACOMBINATIONOFINVALIDSALTANDPASSWORDTHATMUSTN
| EVERBRBEUSED | caching_sha2_password | localhost |
| root | $A$005$M6N?F]-H\pZ!_t_D/Dfa2ONxoHI0gUhLUA/6FCGP1nF4rD/KEJuE
| DHSn6/ | caching_sha2_password | localhost |
| sasha | $A$005$0}PnJB`J^sRAT|auS1Zzu6KwqybTHjqLJcr3Nao7ITanWQOMG2aZ
| YJkYI9 | caching_sha2_password | localhost |
+-----+
8 rows in set (0,00 sec)

mysql>

```

use mysql

show tables;

```

sasha@sasha-VM: ~
+-----+
| Host | Db | User | Select_priv | Insert_priv |
| Update_priv | Delete_priv | Create_priv | Drop_priv | Grant_priv | References_p
| Index_priv | Alter_priv | Create_tmp_table_priv | Lock_tables_priv | Crea
| te_view_priv | Show_view_priv | Create_routine_priv | Alter_routine_priv | Exec
| ute_priv | Event_priv | Trigger_priv |
+-----+
+-----+
| localhost | performance_schema | mysql.session | Y | N | | | |
| N | N | N | N | N | N | N | N |
| N | N | N | N | N | N | N | N |
| localhost | sys | mysql.sys | N | N |
| N | N | N | N | N | N | N | N |
| N | N | N | N | N | N | N | N |
+-----+
2 rows in set (0,00 sec)

mysql>

```

select \* from db;

select \* from global\_grants;

```
Activities Terminal rpy 7 15:54
sasha@sasha-VM: ~
mysql> select * from global_grants;
+-----+-----+-----+-----+
| USER | HOST | PRIV | WITH_GRANT_OPTIO |
+-----+-----+-----+-----+
| Vasya | localhost | APPLICATION_PASSWORD_ADMIN | N |
| Vasya | localhost | AUDIT_ADMIN | N |
| Vasya | localhost | AUTHENTICATION_POLICY_ADMIN | N |
| Vasya | localhost | BACKUP_ADMIN | N |
| Vasya | localhost | BINLOG_ADMIN | N |
| Vasya | localhost | BINLOG_ENCRYPTION_ADMIN | N |
| Vasya | localhost | CLONE_ADMIN | N |
| Vasya | localhost | CONNECTION_ADMIN | N |
| Vasya | localhost | ENCRYPTION_KEY_ADMIN | N |
| Vasya | localhost | FLUSH_OPTIMIZER_COSTS | N |
| Vasya | localhost | FLUSH_STATUS | N |
```

## Part 2

### 1. Make backup my database

```
mysqldump -u root -p auto > ~/db/auto_backup.sql
```

```
mysql -u root -p
```

```
use auto;
```

```
drop table port;
```

```
show tables;
```

```
exit
```

```
Activities Terminal rpy 7 17:01
sasha@sasha-VM: ~/db
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
mysql> show tables
+-----+
| Tables_in_auto |
+-----+
| auto           |
| owners         |
| port           |
+-----+
3 rows in set (0,01 sec)

mysql> drop table port;
Query OK, 0 rows affected (0,08 sec)

mysql> show tables
+-----+
| Tables_in_auto |
+-----+
| auto           |
| owners         |
+-----+
2 rows in set (0,01 sec)

mysql>
```



## 2. Restore my database

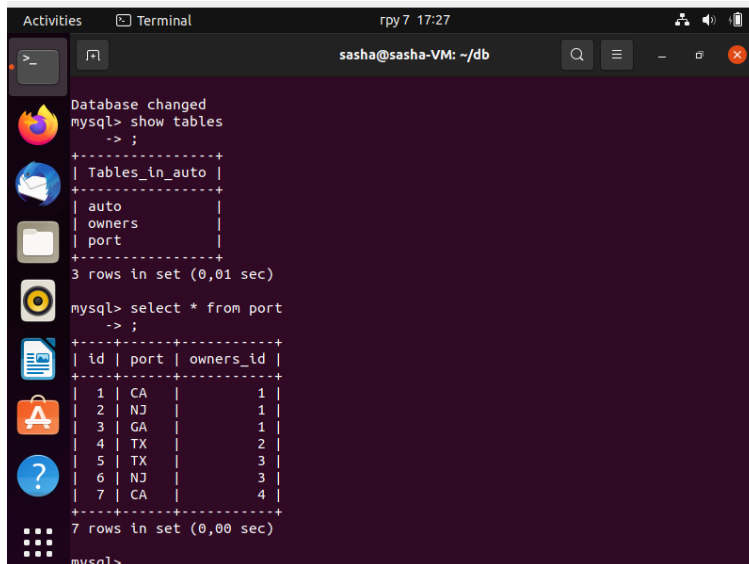
```
mysql -u root -p auto < ~/db/auto_backup.sql
```

```
mysql -u root -p
```

```
use auto;
```

```
SELECT * from port;
```

```
exit
```



The screenshot shows a terminal window with the following content:

```
Database changed
mysql> show tables
+-----+
| Tables_in_auto |
+-----+
| auto           |
| owners         |
| port           |
+-----+
3 rows in set (0,01 sec)

mysql> select * from port
+----+-----+-----+
| id | port | owners_id |
+----+-----+-----+
| 1  | CA   | 1         |
| 2  | NJ   | 1         |
| 3  | GA   | 1         |
| 4  | TX   | 2         |
| 5  | TX   | 3         |
| 6  | NJ   | 3         |
| 7  | CA   | 4         |
+----+-----+-----+
7 rows in set (0,00 sec)
```

## 3. Mysql -u sasha -p -h mysql-database.cgf6ymosiqgl.eu-central-1.rds.amazonaws.com

Show databases

Quit

```
Mysql -u sasha -p -h mysql-database.cgf6ymosiqgl.eu-central-1.rds.amazonaws.com < ~/db/auto_backup.sql
```

Show databases

Quit

### Part 3

1. Amazon DynamoDB is a fully managed NoSQL database service that provides fast and predictable performance with seamless scalability.
2. Dynamo>Items>Create table
3. Add data to table