

Database Administration homework

1. Download MySQL server for your OS on VM &&
2. Install MySQL server on VM.

```
ninja@ubuntu5:~$ sudo apt install mysql-server
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libbcb-fast-perl libbcb-pm-perl libclone-perl libencode-locale-perl libevent-pthreads-2.1-7 libfcgi-bin libfcgi-perl libfcgi0ldbl libhtml-parser-perl libhtml-tagset-perl libhtml-template-perl
  libhttp-date-perl libhttp-message-perl libio-html-perl liblwp-mediatypes-perl libmecab2 libprotobuf-lite23 libtimedate-perl liburi-perl mecab-ipadic mecab-ipadic-utf8 mecab-utils mysql-client-8.0
  mysql-client-core-8.0 mysql-common mysql-server-8.0 mysql-server-core-8.0
Suggested packages:
  libdata-dump-perl libipc-sharedcache-perl libbusiness-isbn-perl libwww-perl mailx tinyca
The following NEW packages will be installed:
  libbcb-fast-perl libbcb-pm-perl libclone-perl libencode-locale-perl libevent-pthreads-2.1-7 libfcgi-bin libfcgi-perl libfcgi0ldbl libhtml-parser-perl libhtml-tagset-perl libhtml-template-perl
  libhttp-date-perl libhttp-message-perl libio-html-perl liblwp-mediatypes-perl libmecab2 libprotobuf-lite23 libtimedate-perl liburi-perl mecab-ipadic mecab-ipadic-utf8 mecab-utils mysql-client-8.0
  mysql-client-core-8.0 mysql-common mysql-server mysql-server-8.0 mysql-server-core-8.0
0 upgraded, 28 newly installed, 0 to remove and 59 not upgraded.
Need to get 29.3 MB of archives.
After this operation, 242 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://ua.archive.ubuntu.com/ubuntu jammy/main amd64 mysql-common all 5.8+1.0.8 [7,212 B]
Get:2 http://ua.archive.ubuntu.com/ubuntu jammy-updates/main amd64 mysql-client-core-8.0 amd64 8.0.30-0ubuntu0.22.04.1 [2,757 kB]
Get:3 http://ua.archive.ubuntu.com/ubuntu jammy-updates/main amd64 mysql-client-8.0 amd64 8.0.30-0ubuntu0.22.04.1 [22.7 kB]
Get:4 http://ua.archive.ubuntu.com/ubuntu jammy/main amd64 libevent-pthreads-2.1-7 amd64 2.1.12-stable-1build3 [7,642 B]
```

3. Select a
CARS. Drivers. Salary
model. — Name_r. — money
LN. LN. LN

subject area and describe the database schema, (minimum 3 tables)

4. Create a database on the server through the console

```
mysql> create database db_test;
Query OK, 1 row affected (0.02 sec)

mysql> create table drivers (recid int auto_increment primary key, name_r varchar(50), age int, ln int);
ERROR 1046 (3D000): No database selected
mysql> use db_test
Database changed
mysql> create table drivers (recid int auto_increment primary key, name_r varchar(50), age int, ln int);
Query OK, 0 rows affected (0.06 sec)

mysql> create table cars (recid int auto_increment primary key, model varchar(30), ln int);
Query OK, 0 rows affected (0.04 sec)

mysql> create table salary (recid int auto_increment primary key, money int, ln int);
Query OK, 0 rows affected (0.04 sec)

mysql> show tables;
+-----+
| Tables_in_db_test |
+-----+
| cars               |
| drivers            |
| salary             |
+-----+
3 rows in set (0.00 sec)

mysql>
```

5. Fill in tables.

```
mysql> insert into drivers (name_r,age,ln) values ('Vasya',32,10231),('Petya',45,10246),('Kolya',62,8934),('Ivan',25,11592);
Query OK, 4 rows affected (0.05 sec)
Records: 4 Duplicates: 0 Warnings: 0

mysql> insert into cars (model,ln) values ('Honda',11592),('Mazda',10231),('Jeep',8934),('Fiat',10246),('Gaz',11592),('Hundai',8934),('Bugatti',8934);
Query OK, 7 rows affected (0.01 sec)
Records: 7 Duplicates: 0 Warnings: 0

mysql> insert into salary (money,ln) values (1200,11592),(950,10231),(2200,8934),(1150,10246);
Query OK, 4 rows affected (0.01 sec)
Records: 4 Duplicates: 0 Warnings: 0

mysql>
```

6. Construct and execute SELECT operator with WHERE, GROUP BY and ORDER BY.

select d.name_r, c.ln, count(*) count_of_cars from cars c, drivers d where d.ln=c.ln group by d.name_r,c.ln
order by count_of_cars desc;

```
mysql> select d.name_r, c.ln, count(*) count_of_cars from cars c, drivers d where d.ln=c.ln group by d.name_r,c.ln order by count_of_cars desc;
+-----+-----+-----+
| name_r | ln   | count_of_cars |
+-----+-----+-----+
| Kolya  | 8934 | 2             |
| Ivan   | 11592 | 2             |
| Vasya  | 10231 | 1             |
| Petya  | 10246 | 1             |
+-----+-----+-----+
4 rows in set (0.02 sec)

mysql>
```

7. Execute other different SQL queries DDL, DML, DCL

ddl: CREATE USER 'dbuser'@'localhost' IDENTIFIED BY 'secret';

dml: delete from cars where recid = '27';

dcl: GRANT ALL ON db_test.* TO 'dbuser'@'localhost';

```
mysql> update cars set model='GAZ' where model='Gaz';
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> CREATE USER 'dbuser'@'localhost' IDENTIFIED BY 'secret';
Query OK, 0 rows affected (0.06 sec)

mysql> GRANT ALL ON db_test.* TO 'dbuser'@'localhost';
Query OK, 0 rows affected (0.01 sec)

mysql>
```

8. Create a database of new users with different privileges. Connect to the database as a new user and verify that the privileges allow or deny certain actions.

```
mysql> CREATE USER 'dbuser'@'localhost' IDENTIFIED BY 'secret';
Query OK, 0 rows affected (0.06 sec)

mysql> GRANT ALL ON db_test.* TO 'dbuser'@'localhost';
Query OK, 0 rows affected (0.01 sec)

mysql>
```

```
mysql> exit
Bye
ninja@ubuntu5:~$ mysql -udbuser -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 15
Server version: 8.0.30-0ubuntu0.22.04.1 (Ubuntu)

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owners.

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

mysql> show databases;
+-----+
| Database |
+-----+
| db_test  |
| information_schema |
| performance_schema |
+-----+
3 rows in set (0.00 sec)

mysql>
```

9. Make a selection from the main table DB MySQL.

```
mysql> select * from db_test.drivers; select * from db_test.cars; select * from db_test.salary;
+-----+-----+-----+-----+
| recid | name_r | age | ln |
+-----+-----+-----+-----+
| 1 | Vasya | 32 | 10231 |
| 2 | Petya | 45 | 10246 |
| 3 | Kolya | 62 | 8934 |
| 4 | Ivan | 25 | 11592 |
+-----+-----+-----+-----+
4 rows in set (0.00 sec)

+-----+-----+-----+
| recid | model | ln |
+-----+-----+-----+
| 1 | Honda | 11592 |
| 2 | Mazda | 10231 |
| 3 | Jeep | 8934 |
| 4 | Fiat | 10246 |
| 5 | GAZ | 11592 |
| 6 | Hyundai | 8934 |
| 7 | Bugatti | 8934 |
+-----+-----+-----+
7 rows in set (0.00 sec)

+-----+-----+-----+
| recid | money | ln |
+-----+-----+-----+
| 1 | 1200 | 11592 |
| 2 | 950 | 10231 |
| 3 | 2200 | 8934 |
| 4 | 1150 | 10246 |
+-----+-----+-----+
4 rows in set (0.00 sec)

mysql>
```

10. Make backup of your database.

```
mysqldump -uroot -p --databases db_test > db_test.sql
```

```
ninja@ubuntu:~$ cd temp/
ninja@ubuntu:~/temp$ mysqldump -uroot -p --databases db_test > db_test.sql
Enter password:
ninja@ubuntu:~/temp$ ls
db_test.sql
ninja@ubuntu:~/temp$
```

11. Delete the table and/or part of the data in the table &&

12. Restore your database.

```
Database changed
mysql> show tables;
+-----+
| Tables_in_db_test |
+-----+
| cars               |
| drivers            |
| salary             |
+-----+
3 rows in set (0.00 sec)

mysql> drop table salary;
Query OK, 0 rows affected (0.05 sec)

mysql> show tables;
+-----+
| Tables_in_db_test |
+-----+
| cars               |
| drivers            |
+-----+
2 rows in set (0.00 sec)

mysql> exit
Bye
ninja@ubuntu:~/temp$ mysql -uroot -p db_test < db_test.sql
Enter password:
ninja@ubuntu:~/temp$ mysql -uroot -p
Enter password:
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 20
Server version: 8.0.30-0ubuntu0.22.04.1 (Ubuntu)

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owners.

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

mysql> use db_test; show tables;
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
+-----+
| Tables_in_db_test |
+-----+
| cars               |
| drivers            |
| salary             |
+-----+
3 rows in set (0.00 sec)

mysql>
```

13. Transfer your local database to RDS AWS &&

14. Connect to your database.

Amazon RDS

×

Database

Databases

Query Editor

Performance insights

Snapshots

Automated backups

Reserved instances

Proxies

Subnet groups

Parameter groups

Option groups

Custom engine versions

Events

Event subscriptions

Recommendations 0

Certificate update

database-epam

Summary

DB identifier database-epam	CPU 3.13%	Status Available	Class db.t3.micro
Role Instance	Current activity 1 Connections	Engine MySQL Community	Region & AZ eu-central-1b

Connectivity & security | Monitoring | Logs & events | Configuration | Maintenance & backups | Tags

Connectivity & security

Endpoint & port	Networking	Security
Endpoint database-epam.c2zjjwdqinpi.eu-central-1.rds.amazonaws.com	Availability Zone eu-central-1b	VPC security groups SG_linux_SSH_HTTP (sg-08a5f28575b53047e) Active SG_linux_MySQL (sg-05e0dfeefc29ee5e4) Active
Port 3306	VPC vpc-00ff49a226d51f5e2	Publicly accessible Yes
	Subnet group default-vpc-00ff49a226d51f5e2	Certificate authority rds-ca-2019
	Subnets subnet-0c80422c9d4bb1c1 subnet-07a5cb0a1bcabee65 subnet-0678209d704b07759	Certificate authority date August 22, 2024 (UTC+03:00)

Feedback

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```
ninja@ubuntu5:~/temp$ ping database-epam.c2zjjwdqinpi.eu-central-1.rds.amazonaws.com
PING ec2-52-57-68-17.eu-central-1.compute.amazonaws.com (52.57.68.17) 56(84) bytes of data.
64 --- ec2-52-57-68-17.eu-central-1.compute.amazonaws.com ping statistics ---
5 packets transmitted, 0 received, 100% packet loss, time 4081ms

ninja@ubuntu5:~/temp$ mysql -h database-epam.c2zjjwdqinpi.eu-central-1.rds.amazonaws.com -P 3306 -u admin -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 25
Server version: 8.0.28 Source distribution

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

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
+-----+
4 rows in set (0.04 sec)

mysql>
```

```
ninja@ubuntu5:~/temp$ mysql -h database-epam.c2zjjwdqinpi.eu-central-1.rds.amazonaws.com -P 3306 -u admin -p < db_test.sql
Enter password:
ninja@ubuntu5:~/temp$ mysql -h database-epam.c2zjjwdqinpi.eu-central-1.rds.amazonaws.com -P 3306 -u admin -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 29
Server version: 8.0.28 Source distribution

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

mysql> show databases;
+-----+
| Database |
+-----+
| db_test |
| information_schema |
| mysql |
| performance_schema |
| sys |
+-----+
5 rows in set (0.04 sec)

mysql> show tables;
ERROR 1046 (3D000): No database selected
mysql> use db_test; show tables;
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
+-----+
| Tables_in_db_test |
+-----+
| cars |
| drivers |
| salary |
+-----+
3 rows in set (0.04 sec)

mysql>
```

15. Execute SELECT operator similar step 6.

```
ninja@ubuntu5:~/temp$ mysql -h database-epam.c2zjjwdqinpi.eu-central-1.rds.amazonaws.com -P 3306 -u admin -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 29
Server version: 8.0.28 Source distribution

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owners.

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

mysql> show databases;
+-----+
| Database |
+-----+
| db_test |
| information_schema |
| mysql |
| performance_schema |
| sys |
+-----+
5 rows in set (0.04 sec)

mysql> show tables;
ERROR 1046 (3D000): No database selected
mysql> use db_test; show tables;
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
+-----+
| Tables_in_db_test |
+-----+
| cars |
| drivers |
| salary |
+-----+
3 rows in set (0.04 sec)

mysql> select d.name_r, c.ln, count(*) count_of_cars from cars c, drivers d where d.ln=c.ln group by d.name_r,c.ln order by count_of_cars desc;
+-----+
| name_r | ln | count_of_cars |
+-----+
| Kolya | 8934 | 3 |
| Ilya | 11592 | 2 |
| Vasya | 10231 | 1 |
| Petya | 10246 | 1 |
+-----+
4 rows in set (0.04 sec)

mysql>
```

16. Create the dump of your database.

```
ninja@ubuntu5:~/temp$ mysqldump -h database-epam.c2zjjwdqinpi.eu-central-1.rds.amazonaws.com -P 3306 --databases db_test -u admin -p > db_test_aws.sql
Enter password:
Warning: A partial dump from a server that has GTIDs will by default include the GTIDs of all transactions, even those that changed suppressed parts of the database. If you don't want to restore GTIDs,
pass --set-gtid-purged=OFF. To make a complete dump, pass --all-databases --triggers --routines --events.
ninja@ubuntu5:~/temp$ ls -l
total 8
-rw-rw-r-- 1 ninja ninja 4075 Oct 14 12:56 db_test_aws.sql
-rw-rw-r-- 1 ninja ninja 3810 Oct 14 11:45 db_test.sql
ninja@ubuntu5:~/temp$ head -10 db_test_aws.sql
-- MySQL dump 10.13.1 Distrib 8.0.30, for Linux (x86_64)
--
-- Host: database-epam.c2zjjwdqinpi.eu-central-1.rds.amazonaws.com    Database: db_test
-- Server version          8.0.28

/*!40101 SET @OLD_CHARACTER_SET_CLIENT=@@CHARACTER_SET_CLIENT */;
/*!40101 SET @OLD_CHARACTER_SET_RESULTS=@@CHARACTER_SET_RESULTS */;
/*!40101 SET @OLD_COLLATION_CONNECTION=@@COLLATION_CONNECTION */;
/*!50503 SET NAMES utf8mb4 */;
ninja@ubuntu5:~/temp$
```

17. Create a database. Use the use command to connect to a new database (If it doesn't exist, Mongo will create it when you write to it).

```
ninja@ubuntu5:~/temp$ mongod --version
db version v6.0.2
Build Info:
  "version": "6.0.2",
  "gitVersion": "94fb7dfc8b974f1f5343e7ea394d0d9deedba50e",
  "opensslVersion": "OpenSSL 1.1.1f  31 Mar 2020",
  "modules": [],
  "allocator": "tcmalloc",
  "environment": {
    "distmod": "ubuntu2004",
    "distarch": "x86_64",
    "target_arch": "x86_64"
  }
}

ninja@ubuntu5:~/temp$ mongosh
Current Mongosh Log ID: 6349636e526c8b1ac3120dd
Connecting to:      mongodb://127.0.0.1:27017/?directConnection=true&serverSelectionTimeoutMS=2000&appName=mongosh+1.6.0
Using MongoDB:      6.0.2
Using Mongosh:      1.6.0

For mongosh info see: https://docs.mongodb.com/mongosh-shell/

To help improve our products, anonymous usage data is collected and sent to MongoDB periodically (https://www.mongodb.com/legal/privacy-policy).
You can opt-out by running the disableTelemetry() command.

-----
The server generated these startup warnings when booting
2022-10-14T13:25:38.519+00:00: Using the XFS filesystem is strongly recommended with the WiredTiger storage engine. See http://dochub.mongodb.org/core/prodnotes-filesystem
2022-10-14T13:25:39.271+00:00: Access control is not enabled for the database. Read and write access to data and configuration is unrestricted
2022-10-14T13:25:39.271+00:00: vm.max_map_count is too low
-----

-----
Enable MongoDB's free cloud-based monitoring service, which will then receive and display
metrics about your deployment (disk utilization, CPU, operation statistics, etc).

The monitoring data will be available on a MongoDB website with a unique URL accessible to you
and anyone you share the URL with. MongoDB may use this information to make product
improvements and to suggest MongoDB products and deployment options to you.

To enable free monitoring, run the following command: db.enableFreeMonitoring()
To permanently disable this reminder, run the following command: db.disableFreeMonitoring()
-----

test> show databases;
admin   40.00 KiB
config  60.00 KiB
local   40.00 KiB
test    8.00 KiB
testdb  8.00 KiB
switched to db testdb
```

18. Create a collection. Use db.createCollection to create a collection. I'll leave the subject up to you. Run show dbs and show collections to view your database and collections.

```
testdb> db.createCollection( 'cars' )
{ ok: 1 }
testdb> show collections
cars
testdb> show databases
admin   40.00 KiB
config  92.00 KiB
local   40.00 KiB
test    8.00 KiB
testdb  8.00 KiB
testdb>
```

19. Create some documents. Insert a couple of documents into your collection. I'll leave the subject matter up to you, perhaps cars or hats.

```
testdb> show dbs
admin   40.00 KiB
config  92.00 KiB
local   40.00 KiB
test    8.00 KiB
testdb  8.00 KiB
testdb>
testdb> db.cars.insert({name: 'honda'})
DeprecationWarning: Collection.insert() is deprecated. Use insertOne, insertMany, or bulkWrite.
{
  acknowledged: true,
  insertedIds: { '0': ObjectId("634966ad7d051f944d0e2044") }
}
testdb> db.cars.insert({name: 'fiat'})
{
  acknowledged: true,
  insertedIds: { '0': ObjectId("634966d47d051f944d0e2045") }
}
testdb> db.cars.insert({name: 'bmw'})
{
  acknowledged: true,
  insertedIds: { '0': ObjectId("634966ec7d051f944d0e2046") }
}
testdb>
```

20. Use find() to list documents out.

```
testdb> db.cars.find()
[
  { _id: ObjectId("634966ad7d051f944d0e2044"), name: 'honda' },
  { _id: ObjectId("634966d47d051f944d0e2045"), name: 'fiat' },
  { _id: ObjectId("634966ec7d051f944d0e2046"), name: 'bmw' }
]
```