Database Administration TASK

PART 1

1) Download MySQL server for your OS on VM.

2) Install MySQL server on VM.

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

4) Create a database on the server through the console.

5) Fill in tables.

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

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

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

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

PART 2

10) Make backup of your database.

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

12) Restore your database.

13) Transfer your local database to RDS AWS.

14) Connect to your database.

15) Execute SELECT operator similar step 6.

16) Create the dump of your database.

PART 3–MongoDB

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).

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.

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.

20) Use find() to list documents out.

Execution Steps
PART 1

1) **Download MySQL server for your OS on VM.**
   I am going to install MySQL on a virtual machine with centos 7 distribution.
   To do this, I refer to the MySQL website (https://dev.mysql.com/downloads/repo/yum/), where I can select the required version of the Yum repository, which provides packages for MySQL:

   I download it using curl:

```
[vladyslav@localhost ~]$ ls
[vladyslav@localhost ~]$ curl -LO https://dev.mysql.com/get/mysql80-community-release-el7-7.noarch.r
pm
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--     0
100 11196  100 11196    0     0   8030      0  0:00:01  0:00:01 --:--:--  8030
```

   Then I check the integrity of the file using the md5sum command:

```
[vladyslav@localhost ~]$ md5sum mysql80-community-release-el7-7.noarch.rpm
659400f9842fffb8d64ae0b650f081b9  mysql80-community-release-el7-7.noarch.rpm
[vladyslav@localhost ~]$ _
```

   It should be compared to the hash on the MySql website:

```
MD5: 659400f9842fffb8d64ae0b650f081b9
```

   Everything looks great, so I can go ahead and install the repository:

```
[vladyslav@localhost ~]$ sudo rpm -i mysql80-community-release-el7-7.noarch.rpm
```

2) **Install MySQL server on VM.**
   Now I download and install the MySQL itself using yum command:

```
[vladyslav@localhost ~]$ sudo yum install mysql-server
```

   I start the MySQL daemon and check its status:

```
[vladyslav@localhost ~]$ sudo systemctl start mysqld
[vladyslav@localhost ~]$ sudo systemctl status mysqld
● mysqld.service - MySQL Server
   Loaded: loaded (/usr/lib/systemd/system/mysqld.service; enabled; vendor preset: disabled)
   Active: active (running) since Wed 2022-10-19 12:29:49 EEST; 27s ago
     Docs: man:mysqld(8)
           http://dev.mysql.com/doc/refman/en/using-systemd.html
  Process: 1715 ExecStartPre=/usr/bin/mysqld_pre_systemd (code=exited, status=0/SUCCESS)
 Main PID: 1788 (mysqld)
   Status: "Server is operational"
   CGroup: /system.slice/mysqld.service
           └─1788 /usr/sbin/mysqld

Oct 19 12:29:38 localhost.localdomain systemd[1]: Starting MySQL Server...
Oct 19 12:29:49 localhost.localdomain systemd[1]: Started MySQL Server.
[vladyslav@localhost ~]$
```

   I find the root password:

```
[vladyslav@localhost ~]$ sudo grep "root" /var/log/mysqld.log
2022-10-19T09:29:43.090816Z 6 [Note] [MY-010454] [Server] A temporary password is generated for root
@localhost: =xbTLqjot0la
[vladyslav@localhost ~]$
```

I run a script to set basic server security settings:

```
[vladyslav@localhost ~]$ sudo mysql_secure_installation

Securing the MySQL server deployment.

Enter password for user root: _
```

I choose [yes] for all questions

```
Remove anonymous users? (Press y|Y for Yes, any other key for No) : yes
Success.


Normally, root should only be allowed to connect from
'localhost'. This ensures that someone cannot guess at
the root password from the network.

Disallow root login remotely? (Press y|Y for Yes, any other key for No) : yes
Success.

By default, MySQL comes with a database named 'test' that
anyone can access. This is also intended only for testing,
and should be removed before moving into a production
environment.


Remove test database and access to it? (Press y|Y for Yes, any other key for No) : yes
 - Dropping test database...
Success.

 - Removing privileges on test database...
Success.

Reloading the privilege tables will ensure that all changes
made so far will take effect immediately.

Reload privilege tables now? (Press y|Y for Yes, any other key for No) : yes
Success.

All done!
```

3) Select a subject area and describe the database schema (minimum 3 tables).

My subject area has 3 entities (tables) that are related to each other: “publisher”, “magazine”, “article”.

A publisher can have several magazines, and a magazine, in turn, can have several articles (one-to-many relationships).

Database schema:

4) Create a database on the server through the console.

I create a database called “periodical_literature”:

```
mysql> CREATE DATABASE IF NOT EXISTS periodical_literature  DEFAULT CHARACTER SET utf8;
Query OK, 1 row affected, 1 warning (1.70 sec)
```

I create the three necessary tables:

```
mysql> use periodical_literature;
Database changed
mysql> CREATE TABLE publisher (
    -> publisher_id INT NOT NULL PRIMARY KEY AUTO_INCREMENT,
    -> name VARCHAR(255),
    -> city VARCHAR(255)
    -> );
Query OK, 0 rows affected (2.23 sec)
```

```
mysql> CREATE TABLE magazine (
    -> magazine_id INT NOT NULL PRIMARY KEY AUTO_INCREMENT,
    -> name VARCHAR(255),
    -> description TEXT,
    -> publisher_id INT NOT NULL,
    -> FOREIGN KEY (publisher_id) REFERENCES publisher (publisher_id)
    -> ON DELETE CASCADE
    -> ON UPDATE CASCADE
    -> );
Query OK, 0 rows affected (0.18 sec)
```

```
mysql> CREATE TABLE article (
    -> article_id INT NOT NULL PRIMARY KEY AUTO_INCREMENT,
    -> article_name VARCHAR(255),
    -> author_name VARCHAR(70),
    -> author_surname VARCHAR(70),
    -> sources_number TINYINT UNSIGNED,
    -> pages_number TINYINT UNSIGNED,
    -> magazine_id INT NOT NULL,
    -> FOREIGN KEY (magazine_id) REFERENCES magazine (magazine_id)
    -> ON DELETE CASCADE
    -> ON UPDATE CASCADE
    -> );
Query OK, 0 rows affected (0.03 sec)
```

The result of previous commands:

```
mysql> DESCRIBE article;
+----------------+------------------+------+-----+---------+----------------+
| Field          | Type             | Null | Key | Default | Extra          |
+----------------+------------------+------+-----+---------+----------------+
| article_id     | int              | NO   | PRI | NULL    | auto_increment |
| article_name   | varchar(255)     | YES  |     | NULL    |                |
| author_name    | varchar(70)      | YES  |     | NULL    |                |
| author_surname | varchar(70)      | YES  |     | NULL    |                |
| sources_number | tinyint unsigned | YES  |     | NULL    |                |
| pages_number   | tinyint unsigned | YES  |     | NULL    |                |
| magazine_id    | int              | NO   | MUL | NULL    |                |
+----------------+------------------+------+-----+---------+----------------+
7 rows in set (0.00 sec)

mysql> DESCRIBE magazine;
+--------------+--------------+------+-----+---------+----------------+
| Field        | Type         | Null | Key | Default | Extra          |
+--------------+--------------+------+-----+---------+----------------+
| magazine_id  | int          | NO   | PRI | NULL    | auto_increment |
| name         | varchar(255) | YES  |     | NULL    |                |
| description  | text         | YES  |     | NULL    |                |
| publisher_id | int          | NO   | MUL | NULL    |                |
+--------------+--------------+------+-----+---------+----------------+
4 rows in set (0.01 sec)

mysql> DESCRIBE publisher;
+--------------+--------------+------+-----+---------+----------------+
| Field        | Type         | Null | Key | Default | Extra          |
+--------------+--------------+------+-----+---------+----------------+
| publisher_id | int          | NO   | PRI | NULL    | auto_increment |
| name         | varchar(255) | YES  |     | NULL    |                |
| city         | varchar(255) | YES  |     | NULL    |                |
+--------------+--------------+------+-----+---------+----------------+
3 rows in set (0.01 sec)
```

5) Fill in tables.

Now I'm going to add rows to the tables using the INSERT command:

```
mysql> INSERT publisher VALUES (NULL, 'Teza', 'Kyiv'),
    -> (NULL, 'Tempora', 'Lviv'),
    -> (NULL, 'Monolit', 'Dnipro');
Query OK, 3 rows affected (0.01 sec)
Records: 3  Duplicates: 0  Warnings: 0
```

```
mysql> INSERT magazine VALUES
    -> (NULL, 'Easy Design', 'About easy designing', 1),
    -> (NULL, 'Programming is easy!', 'About programming', 1),
    -> (NULL, 'Literary Bulletin', 'About literature', 2),
    -> (NULL, 'Mathematics without limits', 'About mathematics', 1),
    -> (NULL, 'The history of everything', 'About history', 2),
    -> (NULL, 'School Physics', 'About physics', 1),
    -> (NULL, 'Be Healthy!', "About maintaining a person's physical condition", 3),
    -> (NULL, 'Photographer', 'About photography', 3),
    -> (NULL, 'The beauty of music', 'About music', 3)
    -> ;
Query OK, 9 rows affected (1.62 sec)
Records: 9  Duplicates: 0  Warnings: 0
```

```
mysql> INSERT article VALUES (NULL, 'Logo Modernism', 'Jens', 'Muller', 7, 7, 1);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT article VALUES (NULL, 'Design Elements', 'Aaris', 'Sherin', 16, 9, 1);
Query OK, 1 row affected (0.32 sec)

mysql> INSERT article VALUES (NULL, 'The Secret Lives of Color', 'Kassia', 'St.Clair', 4, 3, 1);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT article VALUES (NULL, 'Inside the machine', 'Jon', 'Stokes', 23, 14, 2);
Query OK, 1 row affected (0.30 sec)

mysql> INSERT article VALUES (NULL, 'Clean Code', 'Robert', 'C.Martin', 14, 7, 2);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT article VALUES (NULL, 'Learning Python', 'Mark', 'Lutz', 33, 25, 2);
Query OK, 1 row affected (0.31 sec)

mysql> INSERT article VALUES (NULL, 'C++. Primer Plus', 'Stephen', 'Prata', 40, 24, 2);
Query OK, 1 row affected (1.63 sec)

mysql>
mysql>
mysql> INSERT article VALUES (NULL, 'Lives of the Novelists', 'John', 'Sutherland', 4, 5, 3);
Query OK, 1 row affected (0.31 sec)

mysql> INSERT article VALUES (NULL, 'The book of forgotten authors', 'Cristopher', 'Fowler', 7, 9, 3
);
Query OK, 1 row affected (0.62 sec)

mysql> INSERT article VALUES (NULL, 'Zero', 'Charles', 'Seife', 8, 4, 4);
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT article VALUES (NULL, 'The Triumph of Numbers', 'Mark', 'Blacklock', 14, 9, 4);
Query OK, 1 row affected (0.31 sec)

mysql> INSERT article VALUES (NULL, 'What is history?', 'Edward', 'Hallett', 4, 6, 5);
Query OK, 1 row affected (0.30 sec)

mysql> INSERT article VALUES (NULL, 'The battle for Spain', 'Antony', 'Beevor', 16, 21, 5);
Query OK, 1 row affected (0.87 sec)

mysql> INSERT article VALUES (NULL, 'A History of the Modern World', 'Robert', 'Palmer', 34, 29, 5);

Query OK, 1 row affected (0.30 sec)

mysql> INSERT article VALUES (NULL, 'A Brief History of Time', 'Stephen', 'Hawking', 24, 20, 6);
Query OK, 1 row affected (0.31 sec)

mysql> INSERT article VALUES (NULL, 'Physics of the impossible', 'Michio', 'Kaku', 20, 18, 6);
Query OK, 1 row affected (0.31 sec)

mysql> INSERT article VALUES (NULL, 'Why we sleep', 'Matthew', 'Walker', 32, 14, 7);
Query OK, 1 row affected (1.62 sec)

mysql> INSERT article VALUES (NULL, 'Breath', 'James', 'Nestor', 15, 11, 7);
Query OK, 1 row affected (0.32 sec)
```

```
mysql> INSERT article VALUES (NULL, 'One Face, Fifty Ways', 'Mark', 'Wilkinson', 12, 29, 8);
Query OK, 1 row affected (0.32 sec)

mysql> INSERT article VALUES (NULL, 'The art of photography', 'Rocky', 'Nook', 6, 15, 8);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT article VALUES (NULL, 'Absolutely on Music', 'Haruki', 'Murakami', 3, 7, 9);
Query OK, 1 row affected (0.30 sec)

mysql> INSERT article VALUES (NULL, 'The lives of the great composers', 'Harold', 'Schonberg', 19, 1
5, 9);
Query OK, 1 row affected (1.64 sec)

mysql> INSERT article VALUES (NULL, 'This is your brain on music', 'Daniel', 'Levitin', 14, 12, 9);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT article VALUES (NULL, 'The great pianists', 'Harold', 'Schronberg', 9, 6, 9);
Query OK, 1 row affected (1.65 sec)

mysql> INSERT article VALUES (NULL, 'An equal music', 'Vikram', 'Seth', 12, 12, 9);
Query OK, 1 row affected (0.07 sec)
```

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

```
mysql> SELECT * FROM magazine WHERE publisher_id=1;
+-------------+---------------------------+----------------------+--------------+
| magazine_id | name                      | description          | publisher_id |
+-------------+---------------------------+----------------------+--------------+
|           1 | Easy Design               | About easy designing |            1 |
|           2 | Programming is easy!      | About programming    |            1 |
|           4 | Mathematics without limits | About mathematics    |            1 |
|           6 | School Physics            | About physics        |            1 |
+-------------+---------------------------+----------------------+--------------+
4 rows in set (0.00 sec)
```

```
mysql> SELECT article_name, pages_number FROM article ORDER BY pages_number DESC;
+---------------------------------+--------------+
| article_name                    | pages_number |
+---------------------------------+--------------+
| One Face, Fifty Ways            |           29 |
| A History of the Modern World   |           29 |
| Learning Python                 |           25 |
| C++. Primer Plus                |           24 |
| The battle for Spain            |           21 |
| A Brief History of Time         |           20 |
| Physics of the impossible       |           18 |
| The lives of the great composers |           15 |
| The art of photography          |           15 |
| Inside the machine              |           14 |
| Why we sleep                    |           14 |
| An equal music                  |           12 |
| This is your brain on music     |           12 |
| Breath                          |           11 |
| The Triumph of Numbers          |            9 |
| The book of forgotten authors   |            9 |
| Design Elements                 |            9 |
| Clean Code                      |            7 |
| Absolutely on Music             |            7 |
| Logo Modernism                  |            7 |
| What is history?                |            6 |
| Digital Photography             |            6 |
| The great pianists              |            6 |
| Lives of the Novelists          |            5 |
| Zero                            |            4 |
| The design of everyday things   |            4 |
| The Secret Lives of Color       |            3 |
+---------------------------------+--------------+
27 rows in set (0.00 sec)
```

```
mysql> SELECT ROUND(AVG(pages_number)), magazine_id FROM article GROUP BY magazine_id;
+-------------------------+-------------+
| ROUND(AVG(pages_number)) | magazine_id |
+-------------------------+-------------+
|                       6 |           1 |
|                      18 |           2 |
|                       7 |           3 |
|                       7 |           4 |
|                      19 |           5 |
|                      19 |           6 |
|                      13 |           7 |
|                      17 |           8 |
|                      10 |           9 |
+-------------------------+-------------+
9 rows in set (0.00 sec)
```

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

Data Definition Language (DDL):

```
mysql> ALTER TABLE publisher ADD COLUMN about TEXT;
Query OK, 0 rows affected (1.91 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

```
mysql> ALTER TABLE publisher DROP COLUMN about;
Query OK, 0 rows affected (0.21 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

```
mysql> ALTER TABLE article MODIFY COLUMN author_surname VARCHAR(100);
Query OK, 27 rows affected (0.23 sec)
Records: 27  Duplicates: 0  Warnings: 0
```

```
mysql> CREATE TABLE test (id_row INT);
Query OK, 0 rows affected (1.67 sec)

mysql> TRUNCATE TABLE test;
Query OK, 0 rows affected (0.23 sec)
```

```
mysql> CREATE DATABASE test;
Query OK, 1 row affected (0.10 sec)

mysql> DROP DATABASE test;
Query OK, 0 rows affected (0.20 sec)
```

Data Manipulation Language (DML):

```
mysql> INSERT INTO article VALUES (NULL, NULL, NULL, NULL, NULL, NULL, 5);
Query OK, 1 row affected (0.00 sec)

mysql> UPDATE article SET
    -> article_name='Moment of history',
    -> author_name='John',
    -> author_surname='Reebon',
    -> sources_number=15,
    -> pages_number=6
    -> WHERE article_name is NULL;
Query OK, 1 row affected (1.69 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> DELETE FROM article WHERE author_surname='Reebon';
Query OK, 1 row affected (0.11 sec)
```

```
mysql> LOCK TABLES publisher WRITE;
Query OK, 0 rows affected (0.00 sec)

mysql> UNLOCK TABLES;
Query OK, 0 rows affected (0.00 sec)
```

Data Control Language (DCL):

```
mysql> CREATE USER lytvynenko IDENTIFIED BY 'Ad123min!';
Query OK, 0 rows affected (0.01 sec)

mysql> GRANT SELECT,INSERT,UPDATE,DELETE ON periodical_literature.* TO lytvynenko;
Query OK, 0 rows affected (0.14 sec)
```

```
mysql> REVOKE DELETE ON *.* FROM lytvynenko;
Query OK, 0 rows affected (0.45 sec)

mysql> GRANT ALL ON publisher TO lytvynenko;
Query OK, 0 rows affected (0.13 sec)

mysql> REVOKE ALL ON *.* FROM lytvynenko;
Query OK, 0 rows affected (0.30 sec)
```

```
mysql> GRANT SELECT, INSERT ON periodical_literature.* TO lytvynenko;
Query OK, 0 rows affected (0.01 sec)

mysql> REVOKE ALL ON periodical_literature.* FROM lytvynenko;
Query OK, 0 rows affected (0.15 sec)
```

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.

I create three users:

```
mysql> CREATE USER admin IDENTIFIED BY 'Ad123min!';
Query OK, 0 rows affected (0.01 sec)

mysql> CREATE USER devops IDENTIFIED BY 'Ad123min!';
Query OK, 0 rows affected (0.33 sec)

mysql> CREATE USER vladyslav IDENTIFIED BY 'Ad123min!';
Query OK, 0 rows affected (1.71 sec)
```

I give them various privileges:

```
mysql> GRANT ALL ON periodical_literature.* TO admin;
Query OK, 0 rows affected (0.01 sec)

mysql> GRANT SELECT ON *.* TO devops;
Query OK, 0 rows affected (0.31 sec)

mysql> GRANT SELECT,INSERT,UPDATE,DELETE ON periodical_literature.* TO vladyslav;
Query OK, 0 rows affected (0.11 sec)
```

Verifying the rights of different users:

admin user:

```
mysql> SELECT USER();
+-----------------+
| USER()          |
+-----------------+
| admin@localhost |
+-----------------+
1 row in set (0.00 sec)

mysql> SELECT article_name, author_name, author_surname FROM article LIMIT 5;
+------------------------------+-------------+----------------+
| article_name                 | author_name | author_surname |
+------------------------------+-------------+----------------+
| The design of everyday things | Donald      | Norman         |
| Logo Modernism               | Jens        | Muller         |
| Design Elements              | Aaris       | Sherin         |
| The Secret Lives of Color    | Kassia      | St.Clair       |
| Inside the machine           | Jon         | Stokes         |
+------------------------------+-------------+----------------+
5 rows in set (0.00 sec)
```

```
mysql> UPDATE article SET article_name='LOGO modernism' WHERE article_name='Logo Modernism';
Query OK, 1 row affected (1.69 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> SELECT article_name, author_name, author_surname FROM article LIMIT 5;
+------------------------------+-------------+----------------+
| article_name                 | author_name | author_surname |
+------------------------------+-------------+----------------+
| The design of everyday things | Donald      | Norman         |
| LOGO modernism               | Jens        | Muller         |
| Design Elements              | Aaris       | Sherin         |
| The Secret Lives of Color    | Kassia      | St.Clair       |
| Inside the machine           | Jon         | Stokes         |
+------------------------------+-------------+----------------+
5 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM informational_schema.VIEWS;
ERROR 1142 (42000): SELECT command denied to user 'admin'@'localhost' for table 'VIEWS'
mysql>
```

devops user:

```
mysql> SELECT USER();
+------------------+
| USER()           |
+------------------+
| devops@localhost |
+------------------+
1 row in set (0.00 sec)
```

```
mysql> SELECT * FROM information_schema.PLUGINS LIMIT 1 \G
*************************** 1. row ***************************
           PLUGIN_NAME: binlog
        PLUGIN_VERSION: 1.0
         PLUGIN_STATUS: ACTIVE
           PLUGIN_TYPE: STORAGE ENGINE
   PLUGIN_TYPE_VERSION: 80031.0
        PLUGIN_LIBRARY: NULL
PLUGIN_LIBRARY_VERSION: NULL
         PLUGIN_AUTHOR: Oracle Corporation
    PLUGIN_DESCRIPTION: This is a pseudo storage engine to represent the binlog in a transaction
        PLUGIN_LICENSE: GPL
           LOAD_OPTION: FORCE
1 row in set (0.00 sec)
```

```
mysql> use periodical_literature;
Database changed
mysql> SELECT * FROM magazine LIMIT 5 \G
*************************** 1. row ***************************
 magazine_id: 1
        name: Easy Design
 description: About easy designing
publisher_id: 1
*************************** 2. row ***************************
 magazine_id: 2
        name: Programming is easy!
 description: About programming
publisher_id: 1
*************************** 3. row ***************************
 magazine_id: 3
        name: Literary Bulletin
 description: About literature
publisher_id: 2
*************************** 4. row ***************************
 magazine_id: 4
        name: Mathematics without limits
 description: About mathematics
publisher_id: 1
*************************** 5. row ***************************
 magazine_id: 5
        name: The history of everything
 description: About history
publisher_id: 2
5 rows in set (0.00 sec)
```

```
mysql> UPDATE article SET author_name="IT'S NOT POSSIBLE" WHERE author_name="John";
ERROR 1142 (42000): UPDATE command denied to user 'devops'@'localhost' for table 'article'
mysql>
```

vladyslav user:

```
mysql> SELECT USER();
+---------------------+
| USER()              |
+---------------------+
| vladyslav@localhost |
+---------------------+
1 row in set (0.00 sec)
```

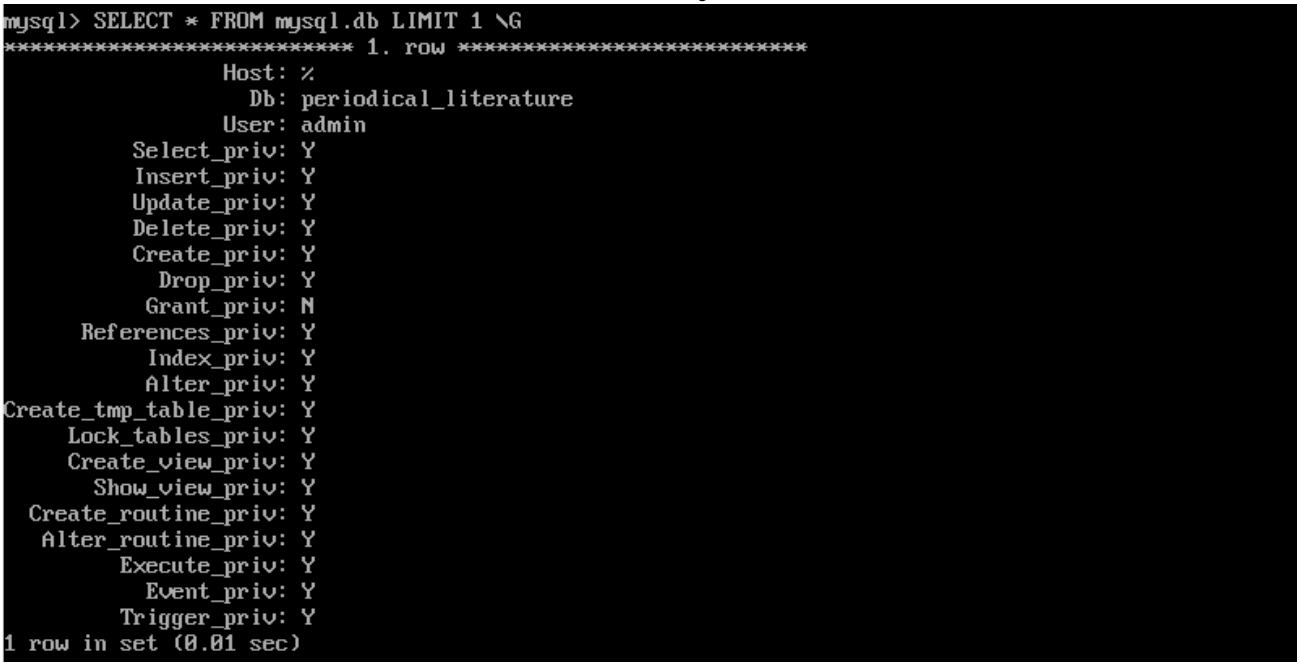
```
mysql> SHOW DATABASES;
+-----------------------+
| Database              |
+-----------------------+
| information_schema    |
| performance_schema    |
| periodical_literature |
+-----------------------+
3 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM information_schema.VIEWS;
Empty set (0.00 sec)
```

```
mysql> DROP DATABASE periodical_literature;
ERROR 1044 (42000): Access denied for user 'vladyslav'@'%' to database 'periodical_literature'
mysql> DROP TABLE periodical_literature.magazine;
ERROR 1142 (42000): DROP command denied to user 'vladyslav'@'localhost' for table 'magazine'
mysql>
```

```
mysql> SELECT * FROM publisher;
+--------------+---------+--------+
| publisher_id | name    | city   |
+--------------+---------+--------+
|            1 | Teza    | Kyiv   |
|            2 | Tempora | Lviv   |
|            3 | Monolit | Dnipro |
+--------------+---------+--------+
3 rows in set (1.65 sec)

mysql> INSERT publisher VALUES (NULL, 'Ranok', 'Kyiv');
Query OK, 1 row affected (0.00 sec)

mysql> DELETE FROM publisher WHERE name='Ranok';
Query OK, 1 row affected (0.13 sec)

mysql> UPDATE publisher SET city='Kherson' WHERE city='Dnipro';
Query OK, 1 row affected (0.31 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> SELECT * FROM PUBLISHER;
ERROR 1146 (42S02): Table 'periodical_literature.PUBLISHER' doesn't exist
mysql> SELECT * FROM publisher;
+--------------+---------+---------+
| publisher_id | name    | city    |
+--------------+---------+---------+
|            1 | Teza    | Kyiv    |
|            2 | Tempora | Lviv    |
|            3 | Monolit | Kherson |
+--------------+---------+---------+
3 rows in set (0.00 sec)
```

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



```
mysql> SELECT * FROM mysql.db LIMIT 1 \G
*************************** 1. row ***************************
                 Host: %
                   Db: periodical_literature
                 User: admin
          Select_priv: Y
          Insert_priv: Y
          Update_priv: Y
          Delete_priv: Y
          Create_priv: Y
            Drop_priv: Y
           Grant_priv: N
      References_priv: Y
           Index_priv: Y
           Alter_priv: Y
Create_tmp_table_priv: Y
     Lock_tables_priv: Y
     Create_view_priv: Y
       Show_view_priv: Y
  Create_routine_priv: Y
   Alter_routine_priv: Y
         Execute_priv: Y
           Event_priv: Y
         Trigger_priv: Y
1 row in set (0.01 sec)
```

PART 2

10) Make backup of your database.

I create a new directory for backup, save the backup in it using the mysqldump command:

```
[vladyslav@localhost ~]$ mkdir ~/mysql_backup
[vladyslav@localhost ~]$ mysqldump -u root -p periodical_literature > ~/mysql_backup/periodical_lite
rature.sql
Enter password:
[vladyslav@localhost ~]$ ls ~/mysql_backup/
periodical_literature.sql
```

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

I delete two tables from the database:

```
mysql> use periodical_literature;
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_periodical_literature |
+---------------------------------+
| article                         |
| magazine                        |
| publisher                       |
| test                            |
+---------------------------------+
4 rows in set (0.01 sec)

mysql> DROP TABLE article, test;
Query OK, 0 rows affected (1.92 sec)

mysql> SHOW TABLES;
+---------------------------------+
| Tables_in_periodical_literature |
+---------------------------------+
| magazine                        |
| publisher                       |
+---------------------------------+
2 rows in set (0.00 sec)
```

12) Restore your database.

I restore the table using the created backup:

```
[vladyslav@localhost ~]$ mysql -u root -p periodical_literature  < ~/mysql_backup/periodical_literat
ure.sql
Enter password:
[vladyslav@localhost ~]$ _
```

Tables are restored:

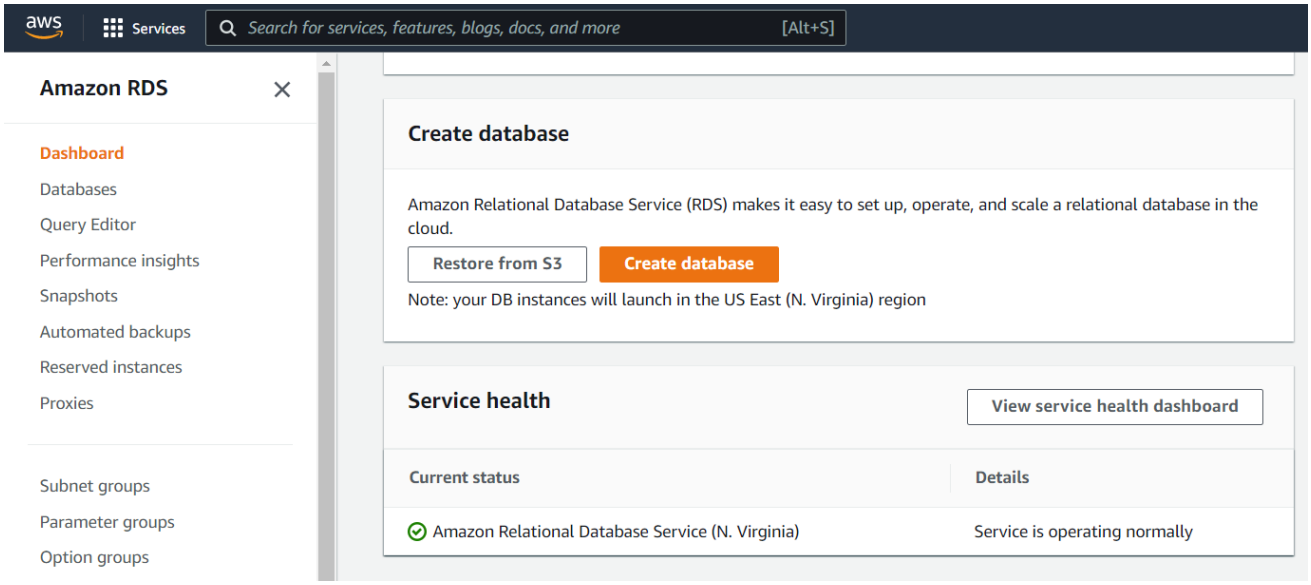
```
Database changed
mysql> SHOW TABLES;
+---------------------------------+
| Tables_in_periodical_literature |
+---------------------------------+
| article                         |
| magazine                        |
| publisher                       |
| test                            |
+---------------------------------+
4 rows in set (0.00 sec)
```

Table content:

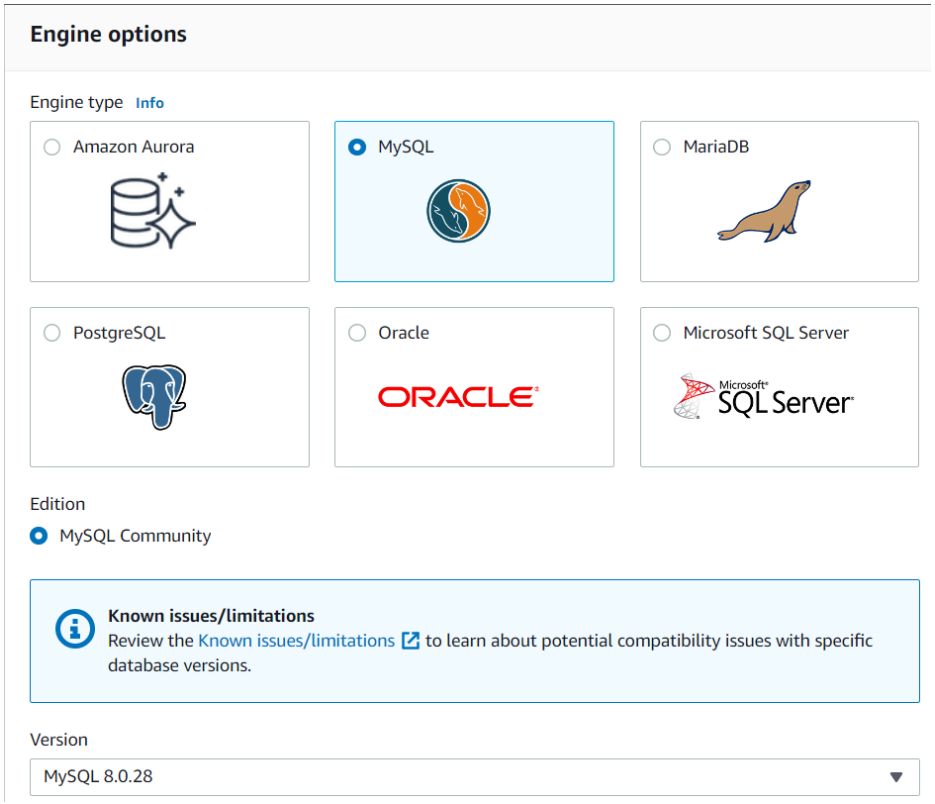
```
mysql> SELECT article_name, author_name, author_surname FROM article;
+--------------------------------+-------------+-----------------+
| article_name                   | author_name | author_surname  |
+--------------------------------+-------------+-----------------+
| Logo Modernism                 | Jens        | Muller          |
| Design Elements                | Aaris       | Sherin          |
| The Secret Lives of Color      | Kassia      | St.Clair        |
| Inside the machine             | Jon         | Stokes          |
| Clean Code                     | Robert      | C.Martin        |
| Learning Python                | Mark        | Lutz            |
| C++. Primer Plus               | Stephen     | Prata           |
| Lives of the Novelists         | John        | Sutherland      |
| The book of forgotten authors  | Cristopher  | Fowler          |
| Zero                           | Charles     | Seife           |
| The Triumph of Numbers         | Mark        | Blacklock       |
| What is history?               | Edward      | Hallett         |
| The battle for Spain           | Antony      | Beevor          |
| A History of the Modern World  | Robert      | Palmer          |
| A Brief History of Time        | Stephen     | Hawking         |
| Physics of the impossible      | Michio      | Kaku            |
| Why we sleep                   | Matthew     | Walker          |
| Breath                         | James       | Nestor          |
| One Face, Fifty Ways           | Mark        | Wilkinson       |
| The art of photography         | Rocky       | Nook            |
| Absolutely on Music            | Haruki      | Murakami        |
| The lives of the great composers | Harold    | Schonberg       |
| This is your brain on music    | Daniel      | Levitin         |
| The great pianists             | Harold      | Schonberg       |
| An equal music                 | Vikram      | Seth            |
+--------------------------------+-------------+-----------------+
25 rows in set (0.00 sec)
```

13) Transfer your local database to RDS AWS.

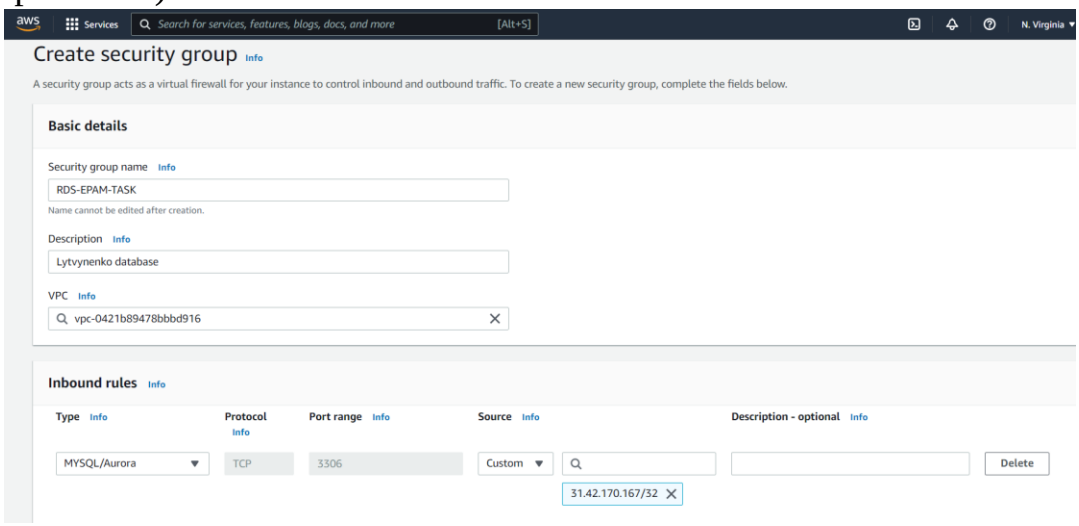
I create a new database in the AWS RDS service:



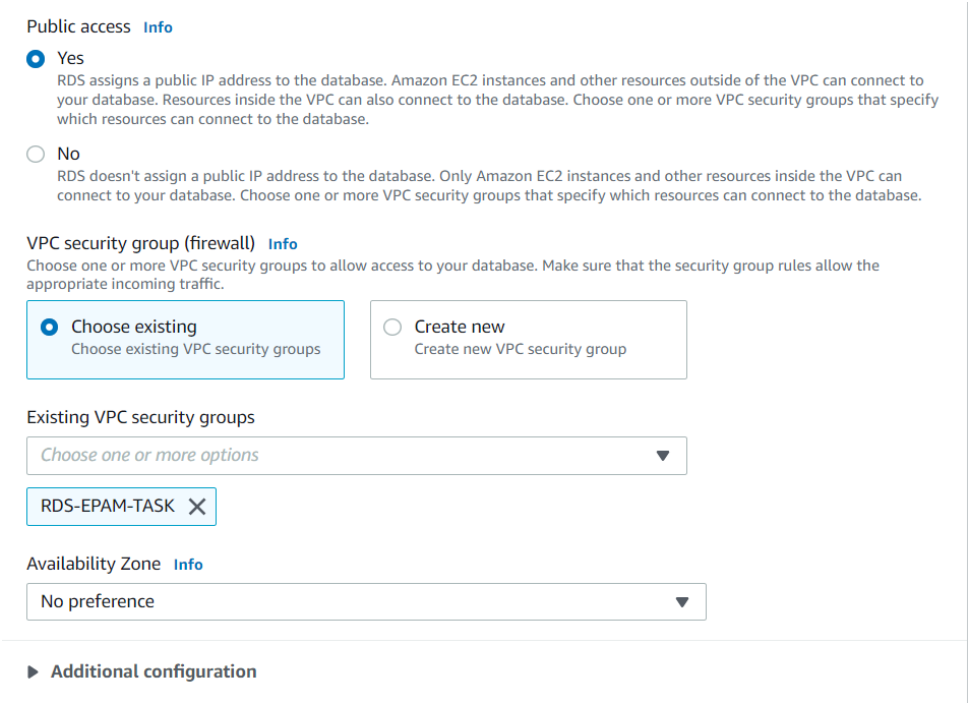
I choose the engine and version in the settings**:**



I create security groups specifically for this database (access is allowed only from my ip address):

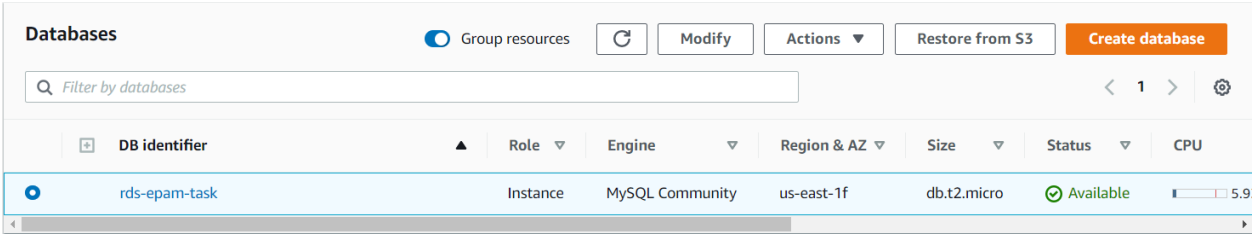


I allow public access to the database and assign the security group to the database:

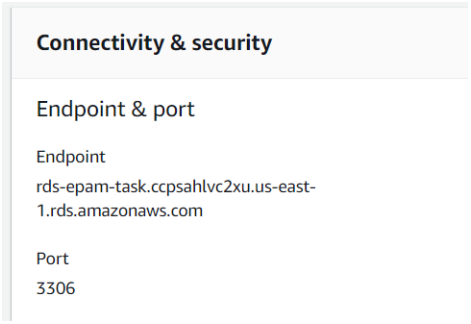


I also make other DB settings.

Database is created:



I open information about the database and find the IP address:



I test the connection to the database from my virtual machine

```
[vladyslav@localhost mysql_backup]$ mysql -h rds-epam-task.ccpsahlvc2xu.us-east-1.rds.amazonaws.com
-u admin -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 22
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> _
```

I create a new database on AWS:

```
mysql> CREATE DATABASE periodical_literature;
Query OK, 1 row affected (0.16 sec)

mysql>
```

I transfer data from the local backup to the server:

```
mysql> exit
Bye
[vladyslav@localhost mysql_backup]$ mysql -h rds-epam-task.ccpsahlvc2xu.us-east-1.rds.amazonaws.com
-u admin -p periodical_literature < periodical_literature.sql
Enter password:
[vladyslav@localhost mysql_backup]$
```

14) Connect to your database.

```
[vladyslav@localhost mysql_backup]$ mysql -h rds-epam-task.ccpsahlvc2xu.us-east-1.rds.amazonaws.com
-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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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>
```

15) Execute SELECT operator similar step 6 (WHERE, GROUP BY and ORDER BY).

```
mysql> SELECT * FROM periodical_literature.magazine WHERE publisher_id=1;
+-------------+---------------------------+----------------------+--------------+
| magazine_id | name                      | description          | publisher_id |
+-------------+---------------------------+----------------------+--------------+
|           1 | Easy Design               | About easy designing |            1 |
|           2 | Programming is easy!      | About programming    |            1 |
|           4 | Mathematics without limits | About mathematics    |            1 |
|           6 | School Physics            | About physics        |            1 |
+-------------+---------------------------+----------------------+--------------+
4 rows in set (0.16 sec)
```

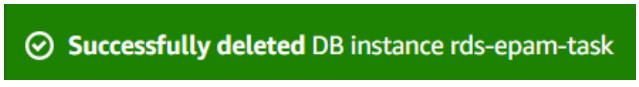
```
mysql> SELECT article_name,pages_number FROM article ORDER BY pages_number ASC;
+---------------------------------+--------------+
| article_name                    | pages_number |
+---------------------------------+--------------+
| The Secret Lives of Color       |            3 |
| Zero                            |            4 |
| Lives of the Novelists          |            5 |
| The lives of the great composers |            5 |
| The great pianists              |            6 |
| What is history?                |            6 |
| Logo Modernism                  |            7 |
| Clean Code                      |            7 |
| Absolutely on Music             |            7 |
| Design Elements                 |            9 |
| The book of forgotten authors   |            9 |
| The Triumph of Numbers          |            9 |
| Breath                          |           11 |
| An equal music                  |           12 |
| This is your brain on music     |           12 |
| Why we sleep                    |           14 |
| Inside the machine              |           14 |
| The art of photography          |           15 |
| Physics of the impossible       |           18 |
| A Brief History of Time         |           20 |
| The battle for Spain            |           21 |
| C++. Primer Plus                |           24 |
| Learning Python                 |           25 |
| One Face, Fifty Ways            |           29 |
| A History of the Modern World   |           29 |
+---------------------------------+--------------+
25 rows in set (0.17 sec)
```

```
mysql> SELECT ROUND(AVG(pages_number)), magazine_id FROM article GROUP BY magazine_id;
+--------------------------+-------------+
| ROUND(AVG(pages_number)) | magazine_id |
+--------------------------+-------------+
|                        6 |           1 |
|                       18 |           2 |
|                        7 |           3 |
|                        7 |           4 |
|                       19 |           5 |
|                       19 |           6 |
|                       13 |           7 |
|                       22 |           8 |
|                        8 |           9 |
+--------------------------+-------------+
9 rows in set (0.23 sec)
```

16) Create the dump of your database.

```
[vladyslav@localhost mysql_backup]$ mysqldump -h rds-epam-task.ccpsahlvc2xu.us-east-1.rds.amazonaws.
com -u admin -p periodical_literature > periodical_literature_2.sql
Enter password:
Warning: A partial dump from a server that has GTIDs will by default include the GTIDs of all transa
ctions, 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.
[vladyslav@localhost mysql_backup]$
```

After all the above I delete the DB on AWS:



PART 3 – MongoDB

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).

I add a new repository on the virtual machine, install MongoDB, run the daemon:

```
[root@localhost yum.repos.d]# cd /etc/yum.repos.d/
[root@localhost yum.repos.d]# touch mongodb-org-6.0.repo
[root@localhost yum.repos.d]# vi mongodb-org-6.0.repo
```

Repository configuration file:

```
[mongodb-org-6.0]
name=MongoDB Repository
baseurl=https://repo.mongodb.org/yum/redhat/$releasever/mongodb-org/6.0/x86_64/
gpgcheck=1
enabled=1
gpgkey=https://www.mongodb.org/static/pgp/server-6.0.asc
```

```
[root@localhost yum.repos.d]# yum install -y mongodb-org
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
 * base: ftp.vectranet.pl
 * extras: centos2.hti.pl
 * updates: centos2.hti.pl
mongodb-org-6.0                                                 | 2.5 kB  00:00:00
```

```
[root@localhost yum.repos.d]# systemctl start mongod
[root@localhost yum.repos.d]# systemctl enable mongod
[root@localhost yum.repos.d]# systemctl status mongod
● mongod.service - MongoDB Database Server
   Loaded: loaded (/usr/lib/systemd/system/mongod.service; enabled; vendor preset: disabled)
   Active: active (running) since Fri 2022-10-21 15:50:33 EEST; 1min 2s ago
     Docs: https://docs.mongodb.org/manual
 Main PID: 1994 (mongod)
   CGroup: /system.slice/mongod.service
           └─1994 /usr/bin/mongod -f /etc/mongod.conf

Oct 21 15:50:31 localhost.localdomain systemd[1]: Starting MongoDB Database Server...
Oct 21 15:50:32 localhost.localdomain mongod[1991]: about to fork child process, waiting until ...s.
Oct 21 15:50:32 localhost.localdomain mongod[1991]: forked process: 1994
Oct 21 15:50:33 localhost.localdomain systemd[1]: Started MongoDB Database Server.
Hint: Some lines were ellipsized, use -l to show in full.
[root@localhost yum.repos.d]# mongosh
```

I create a database called “periodical_literature” using the “use” command:

```
periodical_literature> show dbs
admin    40.00 KiB
config  108.00 KiB
local    40.00 KiB
periodical_literature> use periodical_literature
already on db periodical_literature
```

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.

I create a collection:

```
periodical_literature> db.createCollection("magazines")
{ ok: 1 }
periodical_literature> show dbs
admin                40.00 KiB
config              108.00 KiB
local                40.00 KiB
periodical_literature  8.00 KiB
periodical_literature> show collections
magazines
periodical_literature>
```

19) Create some documents. Insert a couple of documents into your collection.

I insert some documents into collection using “insertOne()” method:

```
periodical_literature> db.magazines.insertOne({name:"Mathematics without limits",about:"About mathem
atics", publisher:"Ranok"})
{
  acknowledged: true,
  insertedId: ObjectId("6352c0155ca71133d3d0960f")
}
periodical_literature> db.magazines.insertOne({name:"The history of everything",about:"About history
", publisher:"Monolit"})
{
  acknowledged: true,
  insertedId: ObjectId("6352c03e5ca71133d3d09610")
}
periodical_literature> db.magazines.insertOne({name:"School Physics",about:"About physics", publishe
r:"Ranok"})
{
  acknowledged: true,
  insertedId: ObjectId("6352c0575ca71133d3d09611")
}
periodical_literature> db.magazines.insertOne({name:"Be Healthy!",about:"About maintaining a preson'
s physucal condition", publisher:"Teza"})
{
  acknowledged: true,
  insertedId: ObjectId("6352c0785ca71133d3d09612")
}
periodical_literature> db.magazines.insertOne({name:"Photograpger",about:"About photography", publis
her:"Monolit"})
{
  acknowledged: true,
  insertedId: ObjectId("6352c0975ca71133d3d09613")
}
periodical_literature> db.magazines.insertOne({name:"The beauty of music",about:"About music", publi
sher:"Teza"})
{
  acknowledged: true,
  insertedId: ObjectId("6352c0b05ca71133d3d09614")
}
periodical_literature> _
```

20) Use find() to list documents out.

```
periodical_literature> db.magazines.find({publisher:"Ranok"})
[
  {
    _id: ObjectId("6352bfdc5ca71133d3d0960e"),
    name: 'Literary Bulletin',
    about: 'About literature',
    publisher: 'Ranok'
  },
  {
    _id: ObjectId("6352c0155ca71133d3d0960f"),
    name: 'Mathematics without limits',
    about: 'About mathematics',
    publisher: 'Ranok'
  },
  {
    _id: ObjectId("6352c0575ca71133d3d09611"),
    name: 'School Physics',
    about: 'About physics',
    publisher: 'Ranok'
  }
]
```

```
periodical_literature> db.magazines.find({publisher:"Monolit"})
[
  {
    _id: ObjectId("63529f5c5ca71133d3d0960d"),
    name: 'Programming',
    about: 'About programming',
    publisher: 'Monolit'
  },
  {
    _id: ObjectId("6352c03e5ca71133d3d09610"),
    name: 'The history of everything',
    about: 'About history',
    publisher: 'Monolit'
  },
  {
    _id: ObjectId("6352c0975ca71133d3d09613"),
    name: 'Photograpger',
    about: 'About photography',
    publisher: 'Monolit'
  }
]
```

```
periodical_literature> db.magazines.find({publisher:"Teza"})
[
  {
    _id: ObjectId("63529eb45ca71133d3d0960c"),
    name: 'Easy Design',
    about: 'About easy designing',
    publisher: 'Teza'
  },
  {
    _id: ObjectId("6352c0785ca71133d3d09612"),
    name: 'Be Healthy!',
    about: "About maintaining a preson's physucal condition",
    publisher: 'Teza'
  },
  {
    _id: ObjectId("6352c0b05ca71133d3d09614"),
    name: 'The beauty of music',
    about: 'About music',
    publisher: 'Teza'
  }
]
```