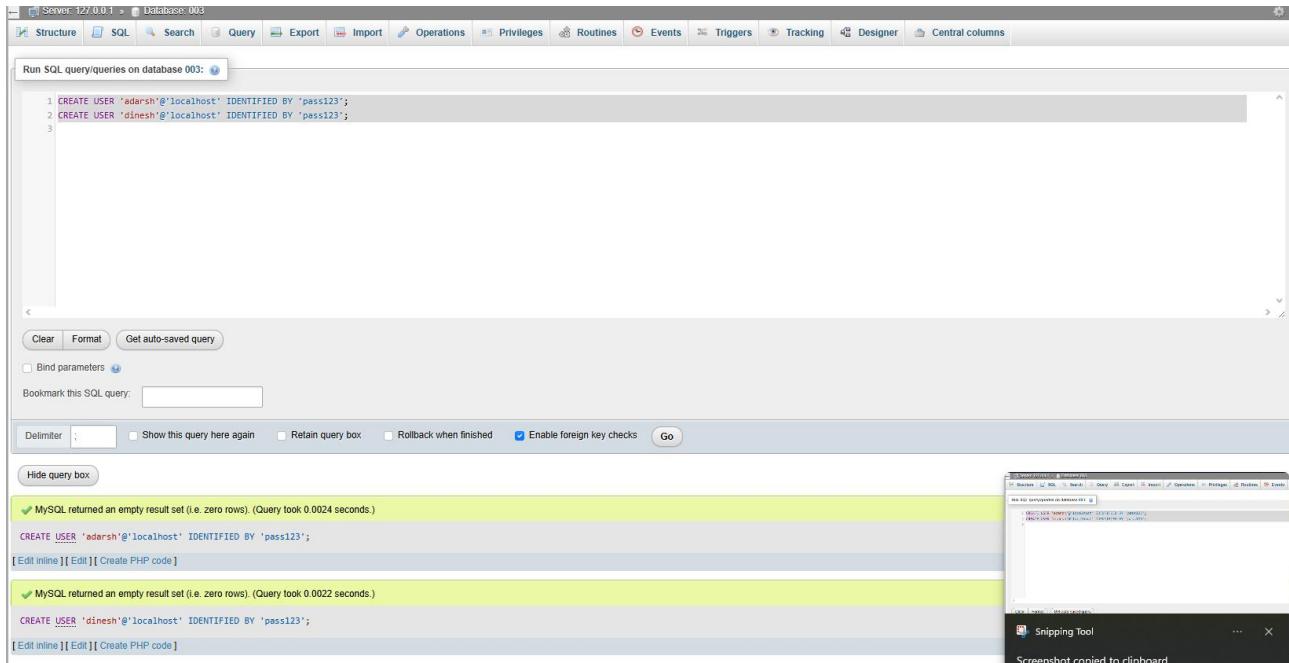


Experiment 1 — User Management with GRANT & REVOKE

Command:

```
CREATE USER 'adarsh'@'localhost' IDENTIFIED BY 'pass123';
CREATE USER 'dinesh'@'localhost' IDENTIFIED BY 'pass123';
```

Output:



The screenshot shows the MySQL Workbench interface with the 'Query' tab selected. A SQL query window contains the following code:

```
1 CREATE USER 'adarsh'@'localhost' IDENTIFIED BY 'pass123';
2 CREATE USER 'dinesh'@'localhost' IDENTIFIED BY 'pass123';
3
```

Below the query window, the results pane displays two green success messages:

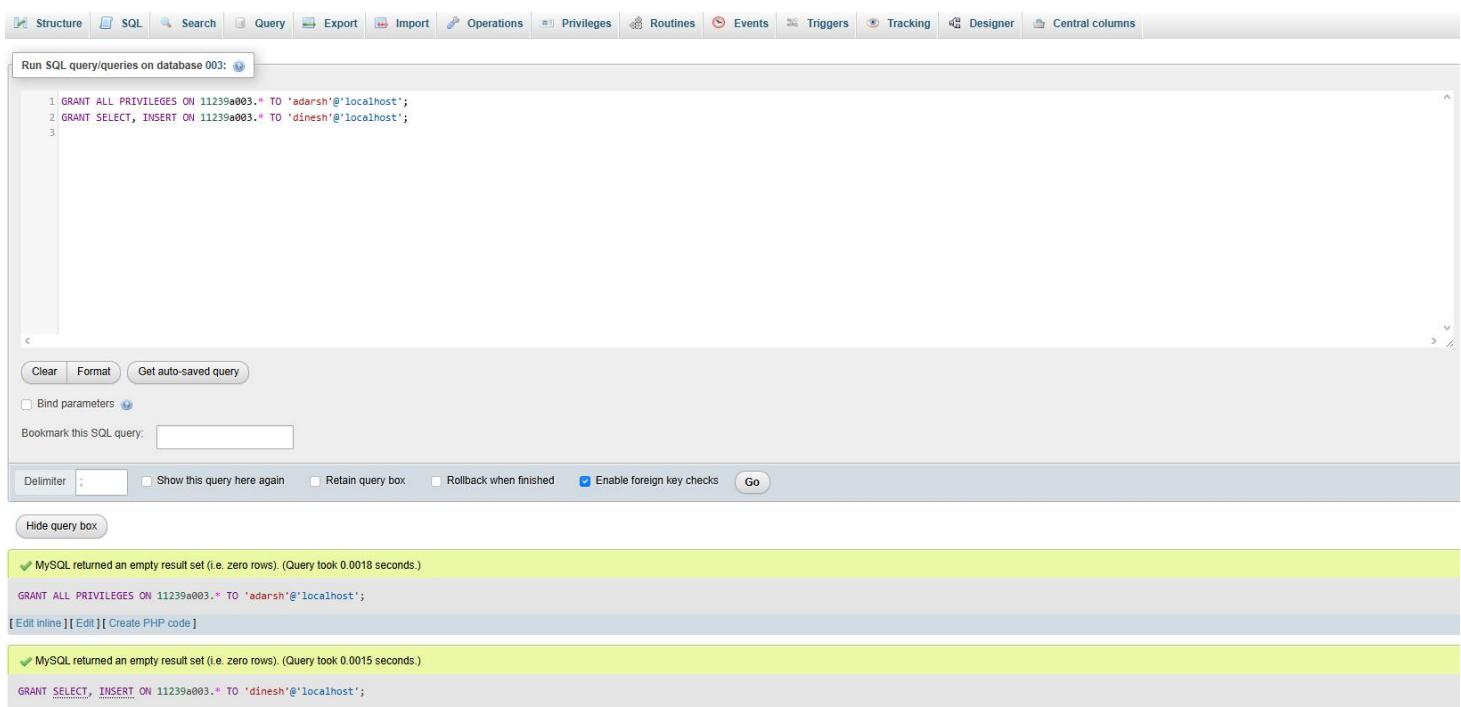
- MySQL returned an empty result set (i.e. zero rows). (Query took 0.0024 seconds.)
CREATE USER 'adarsh'@'localhost' IDENTIFIED BY 'pass123';
- MySQL returned an empty result set (i.e. zero rows). (Query took 0.0022 seconds.)
CREATE USER 'dinesh'@'localhost' IDENTIFIED BY 'pass123';

A small 'Snipping Tool' window is visible in the bottom right corner, indicating a screenshot has been taken.

Command:

```
GRANT ALL PRIVILEGES ON 11239a003.* TO 'adarsh'@'localhost';
GRANT SELECT, INSERT ON 11239a003.* TO 'dinesh'@'localhost';
```

Output:



The screenshot shows the MySQL Workbench interface with the 'Query' tab selected. A SQL query window contains the following code:

```
1 GRANT ALL PRIVILEGES ON 11239a003.* TO 'adarsh'@'localhost';
2 GRANT SELECT, INSERT ON 11239a003.* TO 'dinesh'@'localhost';
3
```

Below the query window, the results pane displays two green success messages:

- MySQL returned an empty result set (i.e. zero rows). (Query took 0.0018 seconds.)
GRANT ALL PRIVILEGES ON 11239a003.* TO 'adarsh'@'localhost';
- MySQL returned an empty result set (i.e. zero rows). (Query took 0.0015 seconds.)
GRANT SELECT, INSERT ON 11239a003.* TO 'dinesh'@'localhost';

Command:

```
REVOKE INSERT ON 11239a003.* FROM 'dinesh'@'localhost';
```

Output:

The screenshot shows the MySQL Workbench interface with the following details:

- Server:** 127.0.0.1
- Database:** 003
- Query Editor:** Contains the SQL command:

```
1 REVOKE INSERT ON 11239a003.* FROM 'dinesh'@'localhost';
2
```
- Buttons:** Clear, Format, Get auto-saved query, Bind parameters, Bookmark this SQL query, Delimiter, Show this query here again, Retain query box, Rollback when finished, Enable foreign key checks, Go.
- Status Bar:** MySQL returned an empty result set (i.e. zero rows). (Query took 0.0024 seconds.)
- Log:** REVOKE INSERT ON 11239a003.* FROM 'dinesh'@'localhost';
- Actions:** [Edit inline] [Edit] [Create PHP code]

Command:

```
SHOW GRANTS FOR 'adarsh'@'localhost';
SHOW GRANTS FOR 'dinesh'@'localhost';
```

Output:

The screenshot shows the MySQL Workbench interface with the following details:

- Server:** 127.0.0.1
- Database:** 003
- Query Editor:** Contains the SQL commands:

```
1 SHOW GRANTS FOR 'adarsh'@'localhost';
2 SHOW GRANTS FOR 'dinesh'@'localhost';
3
```
- Buttons:** Clear, Format, Get auto-saved query, Bind parameters, Bookmark this SQL query, Delimiter, Show this query here again, Retain query box, Rollback when finished, Enable foreign key checks, Go.
- Status Bar:** Your SQL query has been executed successfully.
- Log:** SHOW GRANTS FOR 'adarsh'@'localhost';
GRANT USAGE ON `*.*` TO 'adarsh'@'localhost' IDENTIFIED BY PASSWORD '*****';
GRANT ALL PRIVILEGES ON `11239a003.*` TO 'adarsh'@'localhost' IDENTIFIED BY PASSWORD '*****';

SHOW GRANTS FOR 'dinesh'@'localhost';
GRANT USAGE ON `*.*` TO 'dinesh'@'localhost' IDENTIFIED BY PASSWORD '*****';
GRANT SELECT ON `11239a003.*` TO 'dinesh'@'localhost' IDENTIFIED BY PASSWORD '*****';
- Actions:** [Edit inline] [Edit] [Create PHP code] [Refresh]

Experiment 2 — SQL Injection Demonstration

Command:

```
CREATE TABLE users (
    id INT AUTO_INCREMENT PRIMARY KEY,
    username VARCHAR(50),
    password VARCHAR(50)
);
```

Output :

The screenshot shows the MySQL Workbench interface. The top navigation bar includes tabs for Structure, SQL, Search, Query, Export, Import, Operations, and Privileges. The main area is titled "Run SQL query/queries on database 003". The SQL query entered is:

```
1 CREATE TABLE users (
2     id INT AUTO_INCREMENT PRIMARY KEY,
3     username VARCHAR(50),
4     password VARCHAR(50)
5 );
6
```

Below the query editor, there are several buttons: Clear, Format, Get auto-saved query, Bind parameters, and Bookmark this SQL query. At the bottom, there are options for Delimiter, Show this query here again, Retain query box, Rollback when finished, and Enable. A "Hide query box" button is also present.

The results pane at the bottom displays a green message: "MySQL returned an empty result set (i.e. zero rows). (Query took 0.0003 seconds.)". The query itself is shown again, followed by edit and create PHP code links.

Command :

```
INSERT INTO users (username, password) VALUES
('admin', 'admin123'),
('student', 'stud123');
```

Output :

The screenshot shows the MySQL Workbench interface with the same layout as the previous screenshot. The SQL query entered is:

```
1 INSERT INTO users (username, password) VALUES
2 ('admin', 'admin123'),
3 ('student', 'stud123');
4
```

The results pane at the bottom shows a green message: "2 rows inserted. Inserted row id: 2 (Query took 0.0050 seconds.)". The query is shown again, followed by edit and create PHP code links.

Command:

```
SELECT * FROM users
WHERE username='admin' AND password='admin123';
```

Output:

Run SQL query/queries on table 003.users: [?](#)

```
1 SELECT * FROM users
2 WHERE username='admin' AND password='admin123';
3
```

[SELECT *](#) [SELECT](#) [INSERT](#) [UPDATE](#) [DELETE](#) [Clear](#) [Format](#) [Get auto-saved query](#)

Bind parameters [?](#)

Bookmark this SQL query:

Delimiter : Show this query here again Retain query box Rollback when finished Enable foreign keys

[Hide query box](#)

Showing rows 0 - 0 (1 total, Query took 0.0002 seconds.)

```
SELECT * FROM users WHERE username='admin' AND password='admin123';
```

Profiling [Edit inline](#) [Edit](#) [Explain SQL](#) [Create PHP code](#) [Refresh](#)

Show all | Number of rows: 25 [Filter rows](#): Search this table

[Extra options](#)

	Edit	Copy	Delete	
1	admin	admin123		Edit Copy Delete Export

Show all | Number of rows: 25 [Filter rows](#): Search this table

Command:

```
SELECT * FROM users
WHERE username='admin'
AND password=" OR '1'='1';
```

Output:

Run SQL query/queries on table 003.users: [?](#)

```
1 SELECT * FROM users
2 WHERE username='admin'
3 AND password=" OR '1'='1';
4
```

[SELECT *](#) [SELECT](#) [INSERT](#) [UPDATE](#) [DELETE](#) [Clear](#) [Format](#) [Get auto-saved query](#)

Bind parameters [?](#)

Bookmark this SQL query:

Delimiter : Show this query here again Retain query box Rollback when finished Enable foreign keys

[Hide query box](#)

Showing rows 0 - 1 (2 total, Query took 0.0003 seconds.)

```
SELECT * FROM users WHERE username='admin' AND password=" OR '1'='1';
```

Profiling [Edit inline](#) [Edit](#) [Explain SQL](#) [Create PHP code](#) [Refresh](#)

Show all | Number of rows: 25 [Filter rows](#): Search this table [Sort by key](#): None

[Extra options](#)

	Edit	Copy	Delete	
1	admin	admin123		Edit Copy Delete
2	student	stud123		Edit Copy Delete

Show all | Number of rows: 25 [Filter rows](#): Search this table [Sort by key](#): None

Experiment 3 — Database Auditing (General Log)

Command:

```
SET GLOBAL general_log = 'ON';
```

Output:

Run SQL query/queries on table 003.users:

```
1 SET GLOBAL general_log = 'ON';
2
```

Bind parameters

Bookmark this SQL query:

Delimiter : Show this query here again Retain query box Rollback when finished

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0001 seconds.)

```
SET GLOBAL general_log = 'ON';
```

[Edit inline](#) | [Edit](#) | [Create PHP code](#)

Command:

```
SET GLOBAL log_output = 'TABLE';
```

Output:

Run SQL query/queries on table 003.users:

```
1 SET GLOBAL log_output = 'TABLE';
2
```

Bind parameters

Bookmark this SQL query:

Delimiter : Show this query here again Retain query box Rollback when finished E

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0002 seconds.)

```
SET GLOBAL log_output = 'TABLE';
```

[Edit inline](#) | [Edit](#) | [Create PHP code](#)

Command:

```
SELECT * FROM mysql.general_log  
ORDER BY event_time DESC  
LIMIT 10;
```

Output

The screenshot shows the MySQL Workbench interface with the 'Output' tab selected. A SQL query is run in the top pane:

```
1 SELECT * FROM mysql.general_log  
2 ORDER BY event_time DESC  
3 LIMIT 10;  
4
```

The results are displayed in a table below, showing 10 rows of log entries. The columns are: event_time, user_host, thread_id, server_id, command_type, and argument.

event_time	user_host	thread_id	server_id	command_type	argument
2025-11-14 16:12:55.172587	11239A003[11239A003] @ localhost [127.0.0.1]	2871	1	Query	*
2025-11-14 16:12:55.172284	11239A003[11239A003] @ localhost [127.0.0.1]	2871	1	Init DB	mysql
2025-11-14 16:12:55.171754	11239A003[11239A003] @ localhost [127.0.0.1]	2871	1	Query	SELECT DATABASE ()
2025-11-14 16:12:55.164458	11239A003[11239A003] @ localhost [127.0.0.1]	2871	1	Query	SHOW SESSION VARIABLES
2025-11-14 16:12:55.163318	11239A003[11239A003] @ localhost [127.0.0.1]	2871	1	Query	SHOW SESSION VARIABLES
2025-11-14 16:12:55.161859	11239A003[11239A003] @ localhost [127.0.0.1]	2871	1	Query	SELECT 1 FROM mysql
2025-11-14 16:12:55.158886	11239A003[11239A003] @ localhost [127.0.0.1]	2871	1	Query	SHOW SESSION VARIABLES
2025-11-14 16:12:55.157065	11239A003[11239A003] @ localhost [127.0.0.1]	2871	1	Query	SHOW SESSION VARIABLES
2025-11-14 16:12:55.155917	11239A003[11239A003] @ localhost [127.0.0.1]	2871	1	Query	SHOW SESSION VARIABLES
2025-11-14 16:12:55.153106	11239A003[11239A003] @ localhost [127.0.0.1]	2871	1	Init DB	003

Experiment 4 — Encryption in the Database (AES_ENCRYPT / AES_DECRYPT)

Command:

```
CREATE TABLE secure_data (
    id INT AUTO_INCREMENT PRIMARY KEY,
    secret VARBINARY(255)
);
```

Output:

Run SQL query/queries on table 003.users: 

```
1 CREATE TABLE secure_data (
2     id INT AUTO_INCREMENT PRIMARY KEY,
3     secret VARBINARY(255)
4 );
5
```

Bind parameters 

Bookmark this SQL query:

Delimiter : Show this query here again Retain query box Rollback when finished 

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0003 seconds.)

```
CREATE TABLE secure_data ( id INT AUTO_INCREMENT PRIMARY KEY, secret VARBINARY(255) );
```

[Edit inline](#) [\[Edit \]](#) [\[Create PHP code \]](#)

Command:

```
INSERT INTO secure_data(secret)
VALUES (AES_ENCRYPT('mysecretpassword', 'key123'));
```

Output:

Run SQL query/queries on table 003.users: 

```
1 INSERT INTO secure_data(secret)
2 VALUES (AES_ENCRYPT('mysecretpassword', 'key123'));
3
```

Bind parameters 

Bookmark this SQL query:

Delimiter : Show this query here again Retain query box Rollback when finished 

✓ 1 row inserted.
Inserted row id: 1 (Query took 0.0003 seconds.)

```
INSERT INTO secure_data(secret) VALUES (AES_ENCRYPT('mysecretpassword', 'key123'));
```

[Edit inline](#) [\[Edit \]](#) [\[Create PHP code \]](#)

Command:

```
SELECT
    AES_DECRYPT(secret, 'key123') AS decrypted_value
FROM secure_data;
```

Ouput:

Run SQL query/queries on table 003.users: 

```
1 SELECT
2     AES_DECRYPT(secret, 'key123') AS decrypted_value
3 FROM secure_data;
4
```

Bind parameters 

Bookmark this SQL query:

Delimiter : Show this query here again Retain query box Rollback when finished Enable 

 Current selection does not contain a unique column. Grid edit, checkbox, Edit, Copy and Delete features are not available. 

 Showing rows 0 - 0 (1 total, Query took 0.0004 seconds.)

```
SELECT AES_DECRYPT(secret, 'key123') AS decrypted_value FROM secure_data;
```

Profiling [[Edit inline](#)] [[Edit](#)] [[Explain SQL](#)] [[Create PHP code](#)] [[Refresh](#)]

Show all | Number of rows: Filter rows:

decrypted_value
mysecretpassword

Experiment 5 — Role-Based Access Control (RBAC)

Command:

```
CREATE ROLE 'headmanager';
```

Output:

The screenshot shows the MySQL Workbench interface with a query editor window. The query box contains the command `CREATE ROLE 'headmanager';`. Below the query box are various buttons: `SELECT *`, `SELECT`, `INSERT`, `UPDATE`, `DELETE`, `Clear`, and `Format`. There is also a checkbox for `Bind parameters`. The message area at the bottom indicates that MySQL returned an empty result set (Query took 0.0024 seconds) and shows the executed command again.

```
Run SQL query/queries on table 003.users: ⓘ  
1 CREATE ROLE 'headmanager';  
2  
SELECT * | SELECT | INSERT | UPDATE | DELETE | Clear | Format  
Bind parameters ⓘ  
Bookmark this SQL query:   
Delimiter : Show this query here again Retain query box  
Hide query box  
MySQL returned an empty result set (i.e. zero rows). (Query took 0.0024 seconds.)  
CREATE ROLE 'headmanager';  
[ Edit inline ] [ Edit ] [ Create PHP code ]
```

Command:

```
GRANT SELECT, UPDATE ON 11239a003.* TO 'headmanager';
```

Output:

The screenshot shows the MySQL Workbench interface with a query editor window. The query box contains the command `GRANT SELECT, UPDATE ON 11239a003.* TO 'headmanager';`. Below the query box are various buttons: `SELECT *`, `SELECT`, `INSERT`, `UPDATE`, `DELETE`, `Clear`, `Format`, and `Get auto-saved query`. There is also a checkbox for `Bind parameters`. The message area at the bottom indicates that MySQL returned an empty result set (Query took 0.0019 seconds) and shows the executed command again.

```
Run SQL query/queries on table 003.users: ⓘ  
1 GRANT SELECT, UPDATE ON 11239a003.* TO 'headmanager';  
2  
SELECT * | SELECT | INSERT | UPDATE | DELETE | Clear | Format | Get auto-saved query  
Bind parameters ⓘ  
Bookmark this SQL query:   
Delimiter : Show this query here again Retain query box Rollback when finished  
Hide query box  
MySQL returned an empty result set (i.e. zero rows). (Query took 0.0019 seconds.)  
GRANT SELECT, UPDATE ON 11239a003.* TO 'headmanager';  
[ Edit inline ] [ Edit ] [ Create PHP code ]
```

Command:

```
CREATE USER 'alice'@'localhost' IDENTIFIED BY 'alice123';
```

Output:

Run SQL query/queries on table 003.users: 

```
1 CREATE USER 'alice'@'localhost' IDENTIFIED BY 'alice123';
2
```

Bind parameters 

Bookmark this SQL query:

Delimiter Show this query here again Retain query box Rollback when finished

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0028 seconds.)

```
CREATE USER 'alice'@'localhost' IDENTIFIED BY 'alice123';
```

[Edit inline] [Edit] [Create PHP code]

Command:

```
GRANT 'headmanager' TO 'alice'@'localhost';
```

Output:

Run SQL query/queries on table 003.users: 

```
1 GRANT 'headmanager' TO 'alice'@'localhost';
2
```

Bind parameters 

Bookmark this SQL query:

Delimiter Show this query here again Retain query box Rollback when finished Enable for future use

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0023 seconds.)

```
GRANT 'headmanager' TO 'alice'@'localhost';
```

[Edit inline] [Edit] [Create PHP code]

Command:

```
SHOW GRANTS FOR 'alice'@'localhost';
```

Output:

Run SQL query/queries on table 003.users:

```
1 SHOW GRANTS FOR 'alice'@'localhost';
2
```

Bind parameters

Bookmark this SQL query:

Delimiter Show this query here again Retain query box Rollback when

Current selection does not contain a unique column. Grid edit, checkbox, Edit, Copy and Delete feature

Your SQL query has been executed successfully.

```
SHOW GRANTS FOR 'alice'@'localhost';
```

Profiling [[Edit inline](#)] [[Edit](#)] [[Create PHP code](#)] [[Refresh](#)]

Grants for alice@localhost

```
GRANT `headmanager` TO `alice`@`localhost`
GRANT USAGE ON ** TO `alice`@`localhost` IDENTIFI...
```

Experiment 6 — Backup & Recovery (using XAMPP)

Backup:

Command:

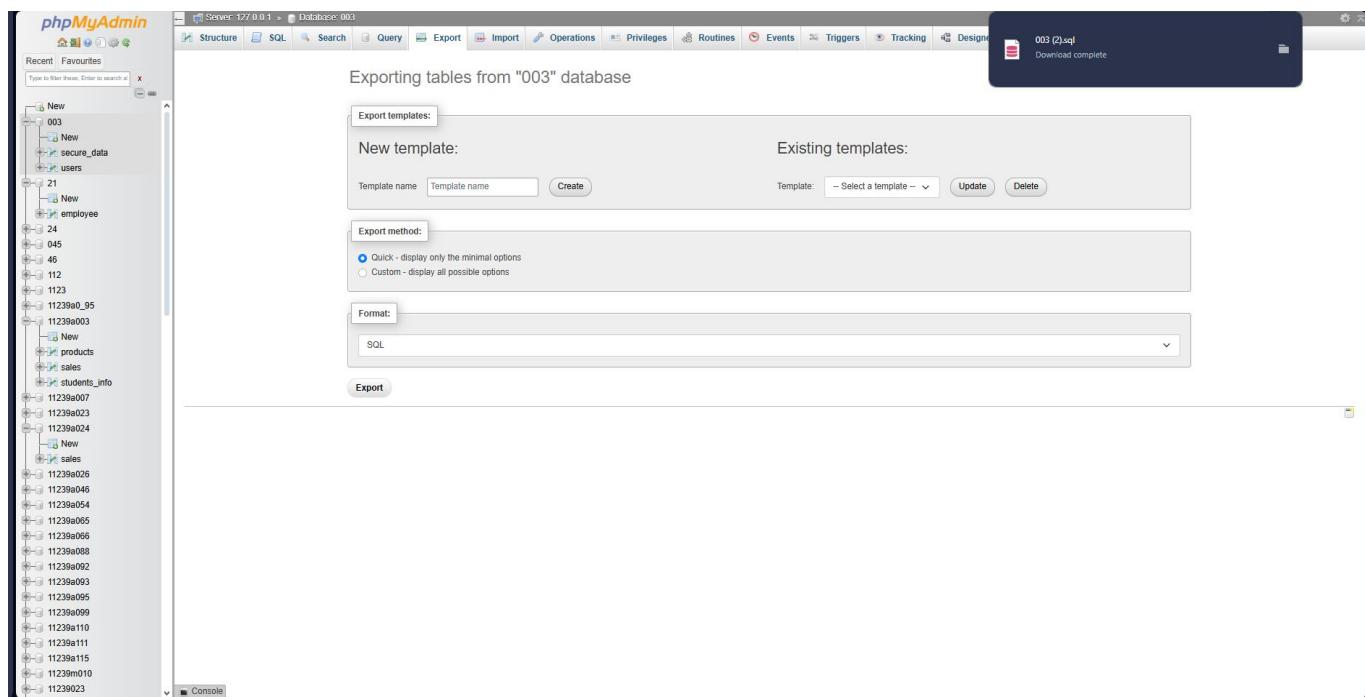
At the top menu in phpMyAdmin, click Export.

Choose Quick export method.

Choose SQL format.

Click Go.

Output:



Restore:

Command:

Click Databases at the top.

In “Create database” box → type::

003_restore.

Click Create.

Ouput:

restore database created.

Command:

On the left side in phpMyAdmin, click the database: 003_restore

At the top, click Import

Click Choose File

Select your backup file (example: 003.sql)

Scroll down and click Go

Ouput:

Database is restored this is the ouput.

P.T.O

Structure SQL Search Query Export Import Operations Privileges Routines Events Triggers Tracking Designer Central columns

✓ Import has been successfully finished, 19 queries executed. (003.sql)

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0001 seconds.)

```
-- phpMyAdmin SQL Dump -- version 5.2.1 -- https://www.phpmyadmin.net/ -- Host: 127.0.0.1 -- Generation Time: Nov 14, 2025 at 12:01 PM -- Server version: 10.4.32-MariaDB -- PHP Version: 8.2.12 SET SQL_MODE = "NO_AUTO_VALUE_ON_ZERO";
```

[Edit inline] [Edit] [Create PHP code]

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0001 seconds.)

```
START TRANSACTION;
```

[Edit inline] [Edit] [Create PHP code]

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0001 seconds.)

```
SET time_zone = "+00:00";
```

[Edit inline] [Edit] [Create PHP code]

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0001 seconds.)

```
/*140101 SET @OLD_CHARACTER_SET_CLIENT=@@CHARACTER_SET_CLIENT */;
```

[Edit inline] [Edit] [Create PHP code]

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0000 seconds.)

```
/*140101 SET @OLD_CHARACTER_SET_RESULTS=@@CHARACTER_SET_RESULTS */;
```

[Edit inline] [Edit] [Create PHP code]

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0001 seconds.)

```
/*140101 SET @OLD_COLLATION_CONNECTION=@@COLLATION_CONNECTION */;
```

[Edit inline] [Edit] [Create PHP code]

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0001 seconds.)

```
/*140101 SET NAMES utf8mb4 */;
```

[Edit inline] [Edit] [Create PHP code]

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0004 seconds.)

```
-- Database: '003' -- Table structure for table 'secure_data' -- CREATE TABLE `secure_data` ( `id` int(11) NOT NULL, `secret` varbinary(255) DEFAULT NULL ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;
```

[Edit inline] [Edit] [Create PHP code]

✓ 1 row inserted. (Query took 0.0003 seconds.)

```
-- Dumping data for table 'secure_data' -- INSERT INTO `secure_data` (`id`, `secret`) VALUES (1, 0x96cac82f52dcc88b2d20c46eb9eabb084145302654d9d6b81879e7802d610);
```

[Edit inline] [Edit] [Create PHP code]

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0006 seconds.)

```
-- Table structure for table 'users' -- CREATE TABLE `users` ( `id` int(11) NOT NULL, `username` varchar(50) DEFAULT NULL, `password` varchar(50) DEFAULT NULL ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;
```

[Edit inline] [Edit] [Create PHP code]

✓ 2 rows inserted. (Query took 0.003 seconds.)

```
-- Dumping data for table 'users' -- INSERT INTO `users` (`id`, `username`, `password`) VALUES (1, 'admin', 'admin123'), (2, 'student', 'stud123');
```

[Edit inline] [Edit] [Create PHP code]

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0004 seconds.)

```
-- Indexes for dumped tables -- Indexes for table 'secure_data' -- ALTER TABLE `secure_data` ADD PRIMARY KEY (`id`);
```

[Edit inline] [Edit] [Create PHP code]

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0004 seconds.)

```
-- Indexes for table 'users' -- ALTER TABLE `users` ADD PRIMARY KEY (`id`);
```

[Edit inline] [Edit] [Create PHP code]

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0003 seconds.)

```
-- AUTO_INCREMENT for dumped tables -- -- AUTO_INCREMENT for table 'secure_data' -- ALTER TABLE `secure_data` MODIFY `id` int(11) NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=2;
```

[Edit inline] [Edit] [Create PHP code]

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0003 seconds.)

```
-- AUTO_INCREMENT for table 'users' -- ALTER TABLE `users` MODIFY `id` int(11) NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=3;
```

[Edit inline] [Edit] [Create PHP code]

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0001 seconds.)

```
COMMIT;
```

[Edit inline] [Edit] [Create PHP code]

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0001 seconds.)

```
/*140101 SET CHARACTER_SET_CLIENT=@OLD_CHARACTER_SET_CLIENT */;
```

[Edit inline] [Edit] [Create PHP code]

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0001 seconds.)

```
/*140101 SET CHARACTER_SET_RESULTS=@OLD_CHARACTER_SET_RESULTS */;
```

[Edit inline] [Edit] [Create PHP code]

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0001 seconds.)

```
/*140101 SET COLLATION_CONNECTION=@OLD_COLLATION_CONNECTION */;
```

[Edit inline] [Edit] [Create PHP code]