

Introductory MySQL Commands

Principles of Databases (CS 365)

UTF-8 Character Set Conflicts

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- Use UTF-8 character sets whenever possible

MySQL Configuration File

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- On macOS, add `my.cnf` to the `/etc` folder.
- In Windows `my.cnf` may be called `my.ini` and could be in one of many places. Read the official documentation from `dev.mysql.com` at <https://dev.mysql.com/doc/refman/8.0/en/option-files.html>

Logging in

The following command says, “Log in to MySQL as user (-u) root and tell the CLI to request my password (-p).

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

Logging in

You can also close the space between -u and root, as follows:

```
mysql -uroot -p
```


Logging in

You can also append the password to the `-p` option. (No space character.) For example, if my password were `password`, I could log in as follows:

```
mysql -u root -ppassword
```

or

```
mysql -uroot -ppassword
```

Logging in

Appending the password to the `-p` option is insecure, as the password would sit as a plain text entry in your CLI's history file.

In bash, for example, you'd find the password in `.bash_history`. You could clear it (and the rest of your history) with the `-c` flag to the `history` command:

```
history -c
```

Logging in

The more secure option is to have MySQL request your password via your CLI.

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

Exiting MySQL

Similar to exiting your CLI, exiting MySQL is simply...

EXIT

Warnings

If an error is generated, you can see the latest warning with

`SHOW WARNINGS;`

Checking the Status of the Database

You can view some important information, such as current user and database, IP address, and character set configurations, using the `STATUS` command:

```
STATUS
```

Creating a Database

Let's create a database called `users` with a default and collation character set of UTF-8.

```
CREATE DATABASE `users` DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4_bin;
```

Note: This doesn't place focus on the new database; it simply creates it.

Creating a Database | Placing Focus

To work with a database, you need to focus on it by using the `USE` command. Let's focus on the `users` database:

```
USE users
```

If you now run `STATUS`, you'll see, `Current database: users` below `Connection id`.

Add a User to the Database with a Password

Let's create a user called the-user whose password is the-password.

```
CREATE USER 'the-user'@'localhost' IDENTIFIED BY 'the-Passw0rd!';
```

Provide a User Access to the Database

Let's now grant the-user *all* privileges to *all* the tables under the users database

```
GRANT ALL PRIVILEGES ON users.* to 'the-user'@'localhost';
```

Logging into the Database with the New User

Exit the database (`exit`), then log back in as the new user:

```
mysql -u the-user -p
```

Show Databases

You can see the databases to which you have access with the SHOW command:

```
SHOW DATABASES;
```

Create a Table

```
CREATE TABLE students (  
    first_name VARCHAR(20) NOT NULL,  
    last_name VARCHAR(20) NOT NULL  
);
```

Note: Both are set to NOT NULL, meaning that an entry into the students table can only happen when both values are present. What happens when you try to defeat the NOT NULL rule?

Show Tables

Show the tables in the current database:

```
SHOW TABLES;
```

Flush the Contents of a Table

To empty the contents of a table is to flush them. Flushing means that MySQL will drop the tables, then recreate them without any entries.

```
TRUNCATE TABLE students;
```

Drop/Delete a Table

Let's delete the `students` table.

```
DROP TABLE students;
```

Note: This isn't the same as `TRUNCATE`, which flushes the tuples in the table, but doesn't delete the table.

Insert a Single Record in a Table (CREATE)

```
INSERT INTO students  
  (first_name, last_name)  
VALUES  
  ("Fred", 'Flinstone');
```

Note: I can wrap values in inch marks (") or foot marks ('), as long as they're balanced.

Insert Multiple Records into a Table (CREATE)

```
INSERT INTO students  
  (first_name, last_name)  
VALUES  
  ("Edward", 'Bobward'),  
  ("Ed", 'Bob'),  
  ("Frank", "Enstein"),  
  ("Johnny", "Rotten");
```

Read All Records from a Table (READ)

```
SELECT * FROM students;
```

Read All Records from a Table with a Matching Clause (READ)

Let's get all students whose first name is Frank.

```
SELECT * FROM students WHERE first_name LIKE "Frank";
```

Read All Records from a Table that Start with a String (READ)

Let's get all students whose first name starts with "ed".

```
SELECT * FROM students WHERE first_name LIKE "Ed%";
```

or for a more case-insensitive search:

```
SELECT * FROM students WHERE UPPER(first_name) LIKE UPPER("ed%");
```

Read All Records from a Table that End with a String (READ)

```
SELECT * FROM students WHERE last_name LIKE "%Bob";
```

Or, for a more case-insensitive search:

```
SELECT * FROM students WHERE UPPER(last_name) LIKE UPPER("%bob");
```

Read All Records from a Table's Column (READ)

Let's get all `first_names` from the `students` table.

```
SELECT first_name FROM students;
```

Read All Records from a Table's Column (READ)

Or last_names.

```
SELECT last_name FROM students;
```


Read All Records from a Table in Reverse Order (READ)

```
SELECT last_name, first_name FROM students;
```

Describe the Fields/Columns in a Table

There are at least 3 different ways to describe the structure of a table.

```
SHOW COLUMNS FROM students;
```

```
DESC students;
```

```
DESCRIBE students;
```

Update (UPDATE)

Let's change Frank's first name to Albert:

```
UPDATE students SET first_name="Albert" WHERE first_name="Frank";
```

Remove (DELETE)

Let's remove Johnny, who's no longer a student:

```
DELETE FROM students WHERE first_name="Johnny";
```