

Using MySQL

MySQL is relational database software that supports structured query language (SQL) for creating and managing, and supporting databases. It can run from the Linux command line and can be used as a back-end for web-based front-ends. It is a good choice for developing prototypes as well as production systems,

Starting the database

In a cloud9 workspace that has access to mysql, a mysql server must be running in order to create or access a database. From the Linux command line, enter:

```
mysqlctl start
```

Starting a MySQL interactive session

To enter into an interactive command-line sessions with the mysql server, where you can enter SQL commands. you use the following command from the Linux command line:

```
mysqlctl cli
```

Creating a Database

A database is a collection of tables, before tables can be created a database must be created. With MySQL you may create multiple databases. It is a good idea to create one database for development, where you care testing and making changes, and a separate database for a client to review which would be more static and consistent. The mysql online gradebook database last year was created using the command

```
CREATE DATABASE olgb;
```

Additional database parameters can be specified using the CREATE DATABASE command, but for our project no additional parameters were required.

Connecting to a Database

Because mysql can support multiple databases, before altering a database you need to connect to the database. This tells mysql which database you will be using. When you are running mysql interactively you will see a prompt such as:

```
mysql>
```

From this command prompt you can issue the `mysql> show databases;` command to see a list of the databases that are available. After you create a database it should be listed with the output of this command.

```
mysql> show databases;
```

To connect to a specific database, use the connect command with the database name. Note SQL commands are terminated with a semicolon;

```
mysql> connect olgb;
```

Internal Assessment

Entering SQL Commands

SQL commands can be entered interactively, one line at a time. But since mistakes are bound to occur it is a good idea to store sql commands in an external file, with a .sql extension, and tell mysql to execute the commands that are in the external file. When you are developing a database system it is likely that you will want to make change to the table structures once in a while, if you drop (delete) tables you will be able to quickly recreated them using external sql commands. You can generate test data and execute test queries as well using external sql files.

Display a list of tables in a database.

Once you are connect to a database you can view a list of all of the tables in the database using the command :

```
mysql> show tables;
```

Display a list of fields in a table

To see a list of fields that are in a table use the **describe** command (desc for short). This will show you the field name as well as the field's data type. The following example was used to display the list of fields from a database table named **School**.

```
mysql> describe School;
```

You may abbreviate the word describe:

```
mysql> desc School;
```

Shutting down the database

When you are finished using the mysql database, prior to terminating your cloud9 session, shut down the database using the following command from the Linux command line:

```
mysql-ctl stop
```

Database Schemas

What is a database schema? At its simplest, a database schema is a collection of definitions of the tables that make up a database, and can be seen as a collection of CREATE TABLE statements. In a relational database system it includes how the tables can – or must – relate to each other. They can identify fields within a table that must be present so they can act as a PRIMARY KEY, and they can specified fields that act as a FOREIGN KEY. FOREIGN KEYS are used to prevent data being inserted into one table (such as a class table) before data is entered into another table (such as a student table). You wouldn't want to have a database that contains class records for students that do not exist. Other items that can be defined as part of a database schema can include which fields are indexed for searching efficiency, how much physical space should be allocated to hold a table or database, and many other parameters.