

Unit 12.1 Highlights

SQL (Structured Query Language) - Programming language allowing developers the ability to create, populate, manipulate, and access databases

MySQL - Relational Database Management System (RDBMS)

MySQL Workbench - software application used to create, populate, manipulate, and access data within relational databases

(Source: <https://en.wikipedia.org/wiki/Localhost>)

localhost - Hostname (or alias) referring to “this computer” or “your computer”. localhost is used to access the network services running on the computer via loopback network interface (runs a network service on a computer without requiring physical network interfaces, and without making the service accessible from the networks the computer may be connected to)

DROP DATABASE IF EXISTS - Removes database IF it already exists. If the database does not exist, no action is taken

CREATE DATABASE - Creates a database

Ex. 1

```
CREATE DATABASE database_name; /* basic CREATE DATABASE format */
CREATE DATABASE products_db; /* products_db has been created */
CREATE DATABASE services_db; /* services_db has been created */
CREATE DATABASE inventory_db; /* inventory_db has been created */
```

USE - Select any existing database in the SQL schema (structure)

Ex. 2

```
USE database_name /* basic USE format */
USE products_db; /* products_db has been selected and subsequent commands will be run on products_db */
USE services_db; /* services_db has been selected and subsequent commands will be run on services_db */
```

CREATE TABLE - Creates a table matching the provided columns, attributes, and datatypes

Ex. 3

```
/* basic CREATE TABLE format */
CREATE TABLE table_name (
    column1 datatype,
    column2 datatype,
    column3 datatype,
    ....
);

CREATE TABLE phone (
    id INTEGER NOT NULL AUTO_INCREMENT,
    device_name VARCHAR(50),
    device_manufacturer VARCHAR(50),
    max_hard_drive_capacity_gb INTEGER,
    PRIMARY KEY (id)
);
```

INSERT INTO - Used to insert new records in a table

Ex. 4

```
/* basic INSERT INTO format, ignore the id field; listing column names is optional*/
INSERT INTO table_name(column1, column2, column3)
VALUES (value1, value2, value3, ...);
```

```
INSERT INTO phone
VALUES ('iPhone XR', 'Apple Inc.', '256');
```

UPDATE - Used to modify the existing records in a table

WHERE - Used to filter records

Ex. 5

```
/* basic UPDATE format, use WHERE to filter by id*/
UPDATE table_name
SET column1 = value1, column2 = value2, ...
WHERE condition;

UPDATE phone
SET device_name = 'Galaxy S9', device_manufacturer = 'Samsung', max_hard_drive_capacity_gb = 1000
WHERE id = 5;
```

Column Constraints

NOT NULL - constraint enforces a column to NOT accept NULL values (columns accept NULL values by default)

PRIMARY KEY - constraint uniquely identifies each record in a database table. Tables can have only one primary key

AUTO_INCREMENT - Requests a unique number to be generated automatically when a new record is inserted into a table

DEFAULT - Used to provide a default value for a column

Ex. 6

```
CREATE TABLE phone (  
    id INTEGER NOT NULL AUTO_INCREMENT, /* unique vals generated for each record w/o NULL values */  
    name VARCHAR(50),  
    manufacturer VARCHAR(50) NOT NULL, /* no NULL values */  
    max_hard_drive_capacity_gb INTEGER,  
    sim_compatible BOOLEAN DEFAULT true,  
    PRIMARY KEY (id)  
);
```

SQL Datatypes

(Source - <https://www.w3schools.com/sql/default.asp>)

VARCHAR(size) - Holds a fixed length string (can contain letters, numbers, and special characters). The fixed size is specified in parenthesis. Max is 255.

INTEGER (size) or INT (size) - -2147483648 to 2147483647 normal. 0 to 4294967295 UNSIGNED*. The maximum number of digits may be specified in parenthesis

FLOAT(size) - A small number with a floating decimal point. The maximum number of digits may be specified in the size parameter. The maximum number of digits to the right of the decimal point is specified in the d parameter

DOUBLE(size,d) - A large number with a floating decimal point. The maximum number of digits may be specified in the size parameter. The maximum number of digits to the right of the decimal point is specified in the d parameter

TEXT - Holds a string with a maximum length of 65,535 characters

Ex. 7

```
CREATE TABLE car (  
    id INTEGER NOT NULL AUTO_INCREMENT, /* unique vals generated for each record w/o NULL values */  
    make VARCHAR(50),  
    model VARCHAR(50) NOT NULL, /* no NULL values */  
    year INTEGER,  
    description TEXT,  
    PRIMARY KEY (id)  
);
```

SQL JOINS

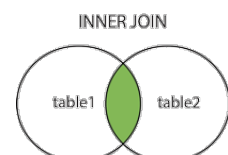
(Source - https://www.w3schools.com/sql/sql_join.asp)

JOINS - Used to combine rows from two or more tables, based on a related column between them.

INNER JOIN - Returns records that have matching values in both tables.

Ex. 8

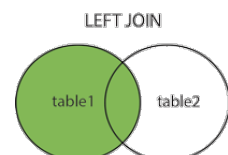
```
SELECT column_name(s)  
FROM table1  
INNER JOIN table2 ON table1.column_name = table2.column_name;
```



LEFT JOIN - Returns all records from the left table (table1), and the matched records from the right table (table2).

Ex. 9

```
SELECT column_name(s)  
FROM table1  
LEFT JOIN table2 ON table1.column_name = table2.column_name;
```



RIGHT JOIN - Returns all records from the right table (table2), and the matched records from the left table (table1).

Ex. 10

```
SELECT column_name(s)  
FROM table1  
RIGHT JOIN table2 ON table1.column_name = table2.column_name;
```

