

## 03 Lecture Notes

### SQL - Part 1 (Structured Queried Language)

SQL is a standard language for storing, manipulating and retrieving data in databases.

#### Learning Resources

<https://www.w3schools.com/sql/> - Complete Sql Program here.

Practice is key - Tutorials available at <https://www.mysqltutorial.org/>.

**NOVA**  
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Check existing databases **SHOW DATABASES;**

Create Database **CREATE DATABASE [IF NOT EXISTS] database\_name**  
**[CHARACTER SET charset\_name]**  
**[COLLATE collation\_name]**

A MySQL character set is a set of characters that are legal in a string

A MySQL collation is a set of rules used to compare characters in a particular character set.

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use Database **USE** database\_name;

Drop Database **DROP DATABASE [IF EXISTS]**  
database\_name;

See tables present  
in the database **SHOW TABLES;**

## Table creation

Create a Table

**CREATE TABLE [IF NOT EXISTS] table\_name(  
column\_name data\_type(length) **NOT NULL** [DEFAULT value] [AUTO\_INCREMENT]  
) ENGINE=storage\_engine;**

The **NOT NULL** indicates that the column does not allow **NULL**

### Create a Table

```
CREATE TABLE [IF NOT EXISTS] table_name(  
column_name data_type(length) [NOT NULL] [DEFAULT value] [AUTO_INCREMENT]  
) ENGINE=storage_engine;
```

The **DEFAULT** value is used to specify the default value of the column

### Create a Table

```
CREATE TABLE [IF NOT EXISTS] table_name(  
column_name data_type(length) [NOT NULL] [DEFAULT value] [AUTO INCREMENT]  
) ENGINE=storage_engine;
```

The **AUTO\_INCREMENT** indicates that the value of the column is incremented by one automatically whenever a new row is inserted into the table. Each table has one and only one **AUTO\_INCREMENT** column

## Create a Table

```
CREATE TABLE [IF NOT EXISTS] table_name(  
column_name data_type(length) [NOT NULL] [DEFAULT value] [AUTO_INCREMENT]  
) ENGINE=storage_engine;
```

Third, you can optionally specify the storage engine for the table in the **ENGINE** clause. You can use any storage engine such as InnoDB and MyISAM. If you don't explicitly declare the storage engine, MySQL will use InnoDB by default.

## Person

```
pid int  
firstname varchar(25)  
surname varchar(25)
```

```
CREATE TABLE Person (  
pid int AUTO_INCREMENT NOT NULL,  
firstname varchar(25) NOT NULL,  
surname varchar(25) NOT NULL,  
);
```

## What are we missing?

Declaring Pid as primary key is missing. See below

## Person

**pid** int  
**firstname** varchar(25)  
**surname** varchar(25)

```
CREATE TABLE Person (
  pid int AUTO_INCREMENT NOT NULL,
  firstname varchar(25) NOT NULL,
  surname varchar(25) NOT NULL,
  PRIMARY KEY (pid)
);
```

What are we missing? The Primary Key

# Create, Read, Update and Delete

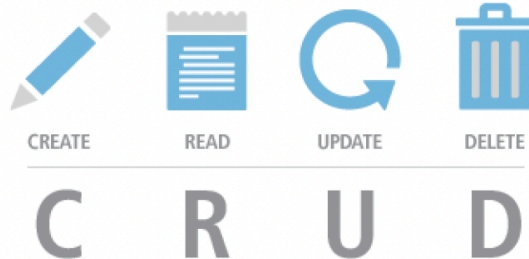


Image source: <https://clofusinnovations.com/blog/post/using-mysql-for-crud-operations-with-nodejs/>

CREATE



# Insert (Create)

```
INSERT INTO table_name(c1,c2,...)  
VALUES(v1,v2,...);
```

Insert one task into the table **tasks**:

```
INSERT INTO tasks(title,priority)  
VALUES('Learn MySQL INSERT Statement',1);
```

	task_id	title	start_date	due_date	priority	description
▶	1	Learn MySQL INSERT Statement	NULL	NULL	1	NULL

READ

# Read

```
SELECT  
    column_1, column_2, ...  
FROM  
    table_1  
[INNER | LEFT | RIGHT] JOIN table_2 ON conditions  
WHERE  
    conditions  
GROUP BY column_1  
HAVING group_conditions  
ORDER BY column_1  
LIMIT offset, length;
```

Do not worry too much  
about joins for now, we  
will see more details  
next class

UPDATE

## Update example

You want to update the email of an employee in table **employee**:

**UPDATE employee**

**SET**

email = 'mary.patterson@classicmodelcars.com'

**WHERE**

employeeNumber = 1056;

	firstname	lastname	email
►	Mary	Patterson	mary.patterson@classicmodelcars.com

DELETE

## Delete

**DELETE FROM** table\_name  
**WHERE** condition;

## Delete example

Delete 5 **customers** in **France**:

```
DELETE FROM customers  
WHERE country = 'France'  
LIMIT 5;
```