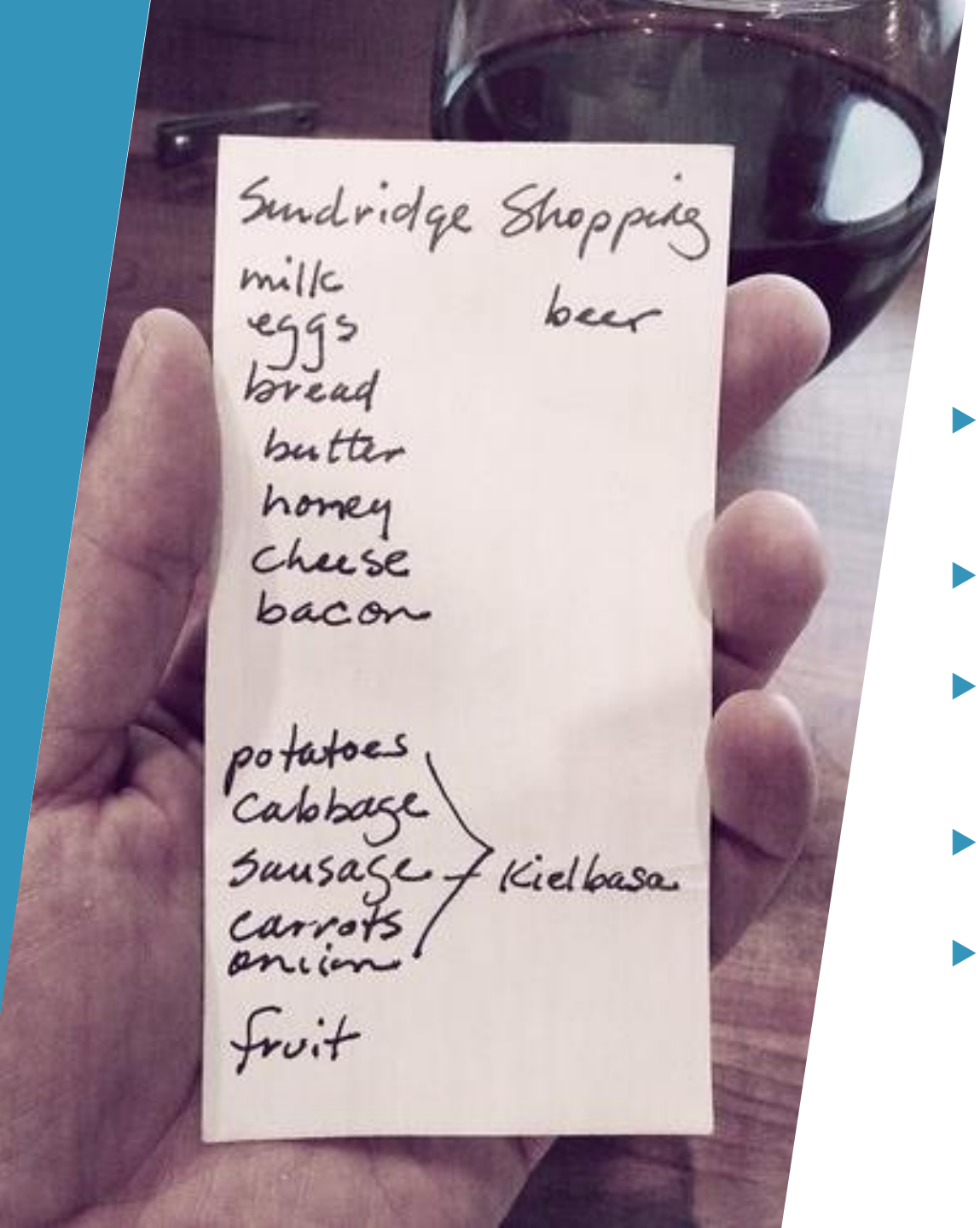
CS7025 Programming for Digital Media

Lesson 10 – Databases



Databases

- A database refers to a set of data and the way it is organised
- A shopping list could be considered a database
- The way it is organised is controlled by a database management system(DBMS)
- There are different types of DBMS's
- Our focus will be on Relational Databases (SQL) and NoSQL databases

Databases

Relational Databases

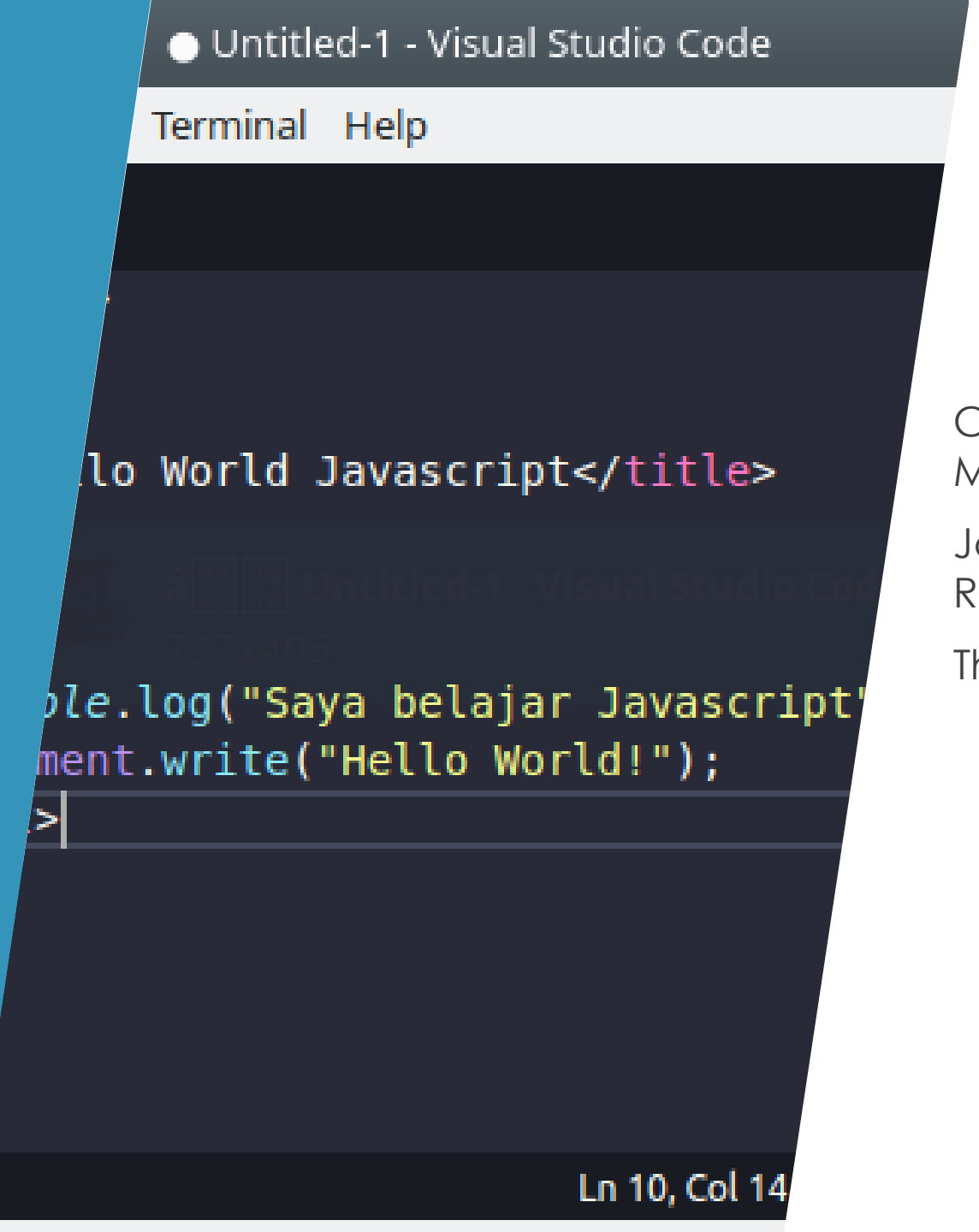
Consider your course:

It's in TCD provided by the school of Computer Science and Statistics.

The course is the MSc in Interactive Digital Media.

It has:

Code	Module	ECTS
CS7025	Programming for Digital Media	10
CS7026	Authoring for Digital Media	10
CS7027	Contextual Media	10
CS7028	Audio, Video and Sensor Technologies	10
CS7029	Visual Computing and Design	10
CS7044	Research Paper	10
CS7043	Final Project	30



Databases Relational Databases

CS7025 Programming for Digital Media is presented by

Joris Vreeke, with help from Rose Connolly

The students are …

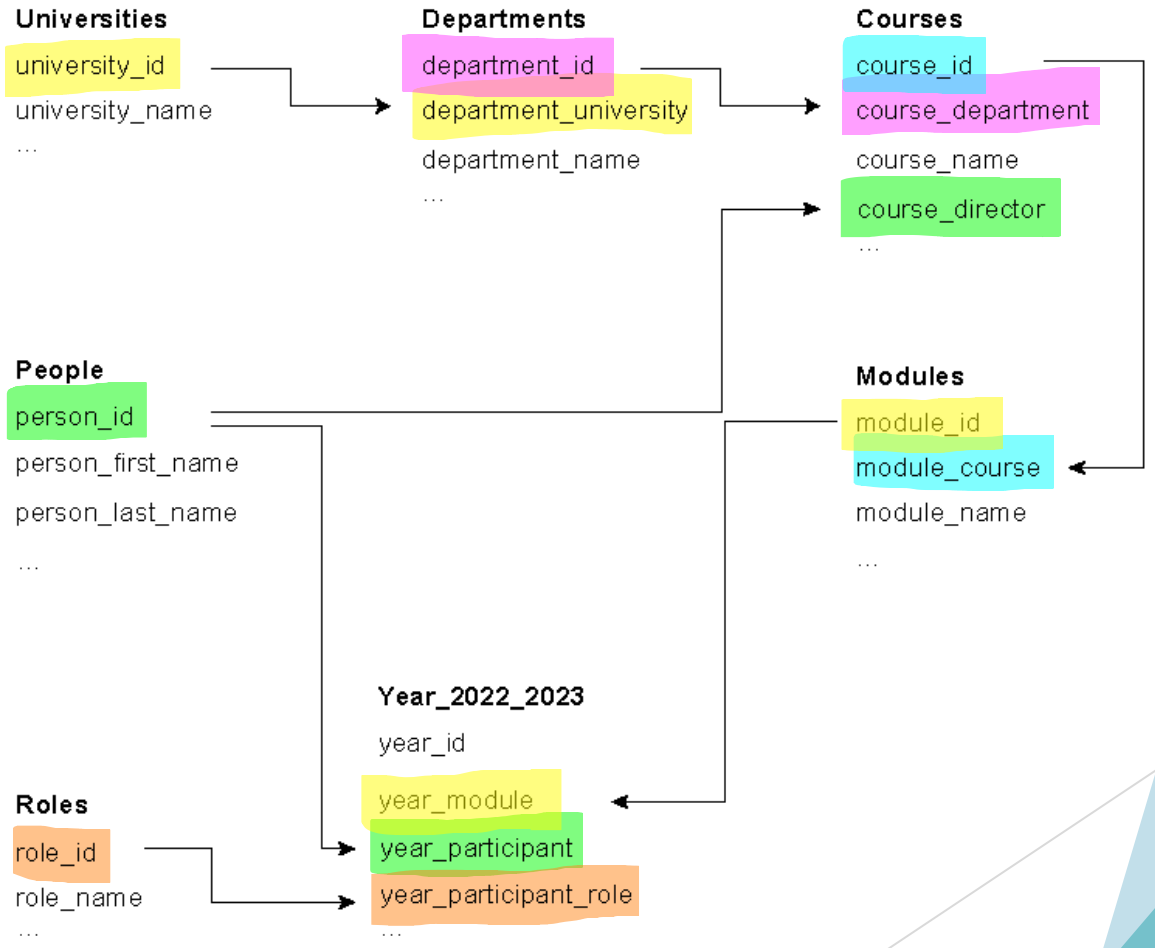
Databases

Relational Databases

- In a Relational Database, we look at single components that have a relation to other components and tie them together through keys
- Every component gets its own table
- Tables have a one-to-many relationship
- In our case: one course can have many students
- This process is called normalization
- The benefit is that if you need to make a change, you only do that once and everything in your entire database gets updated

Databases

Relational Databases



Databases

Relational Databases

module_id	module_name	ECTS
CS7025	Programming for Digital Media	10
CS7026	Authoring for Digital Media	10
CS7027	Contextual Media	10
CS7028	Audio, Video and Sensor Technologies	10

role_id	role_name
1	Lecturer
2	Demonstrator
3	Student
...	...

year_id	year_module	year_participant	year_participant_role
2389	CS7025	237	1
2390	CS7025	278	2
2391	CS7025	299	2
2392	CS7025	310	3

person_id	person_first_name	person_last_name
237	Joris	Vreeke
278	Ben	North
299	Hassan	Zaal
310	John	Doe

Databases

Relational Databases CRUD

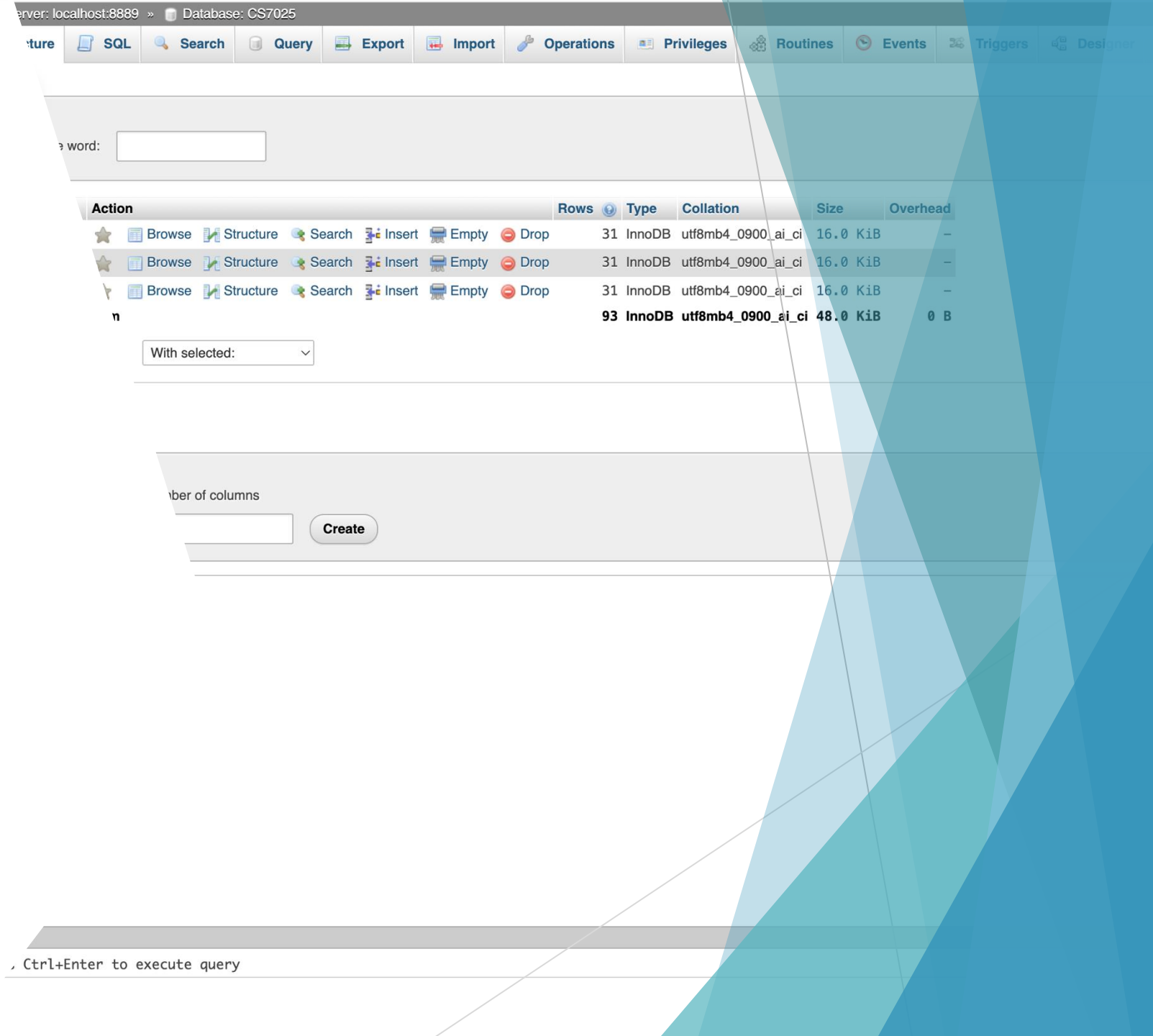
Most (web) applications that interact with databases apply the **CRUD** principle

- **C**reate
- **R**ead
- **U**pdate
- **D**elete

Databases Relational Databases SQL

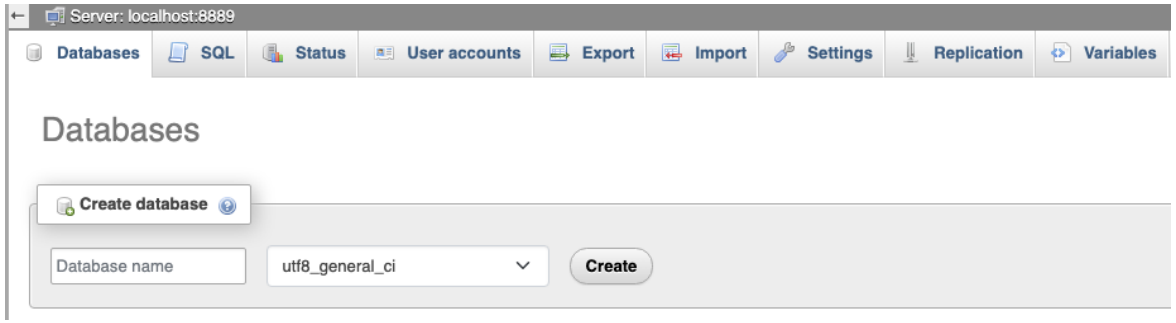
- To perform all the CRUD actions, most relational DBMS's use a Structured Query Language (SQL)

- We're working with MySQL, start MAMP > Tools > phpMyAdmin

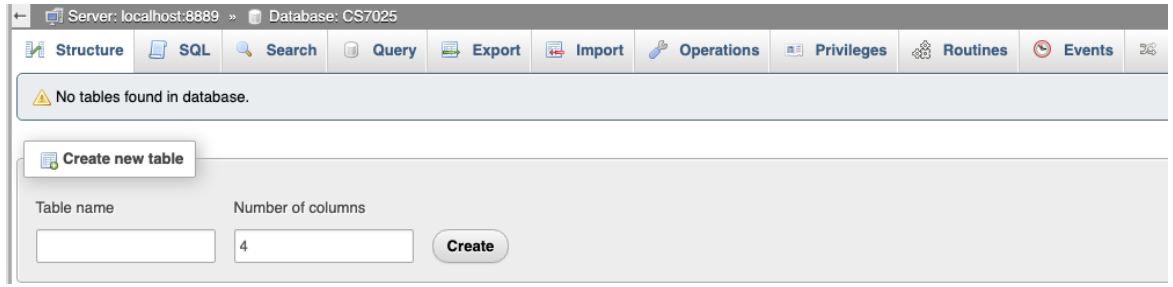


MySQL

- Create a Database



- Create a table



MySQL
Create a Table

To create a table in the database

```
CREATE TABLE table_name (
   column_name1 data_type,
   column_name2 data_type,
   …
);
```

MySQL
Remove or Alter a Table

To remove a table

```
DROP TABLE table_name;
```

To change table columns

- Add new column
  ```
  ALTER TABLE table_name Add column_name data_type;
  ```
- Delete a column
  ```
  ALTER TABLE table_name DROP column_name data_type;
  ```
- Modify a column datatype
  ```
  ALTER TABLE table_name MODIFY column_name new_data_type;
  ```

MySQL
Enter Data into a Table

To insert data into a table (**C**RUD)

```
INSERT
INTO table_name (column_name1, column_name2, column_name3)
VALUES          (“value1”,     “value2”,     “value3”);
```

MySQL
Read Data from a Table

To read data from a table (C**R**UD)

```
SELECT *
FROM table_name;
```

Order the data in a column

```
SELECT *                          //  or column names separated by ,
FROM table_name
ORDER BY column_name ASC/DESC; //  one of these depending on
                                      how you want to sort the data
```

MySQL
Update Data in a Table

To update data in a table (CR**U**D)

```
UPDATE table_name
SET column_name1 = “new_value”
WHERE column_name2 = “some_value”;
```

MySQL
Delete Data from a Table

To delete data from a table (CRU**D**)

```
DELETE FROM table_name
WHERE column_name2 = “some_value”;
```

MySQL
Sample Table

```
CREATE TABLE `students' (
    student_id int NOT NULL AUTO_INCREMENT,
    student_first_name varchar(100),
    student_last_name varchar(100),
    student_email_address varchar(255),
    PRIMARY KEY (person_id)
);
```

Try it yourself

Scratch

Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
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Thank You

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