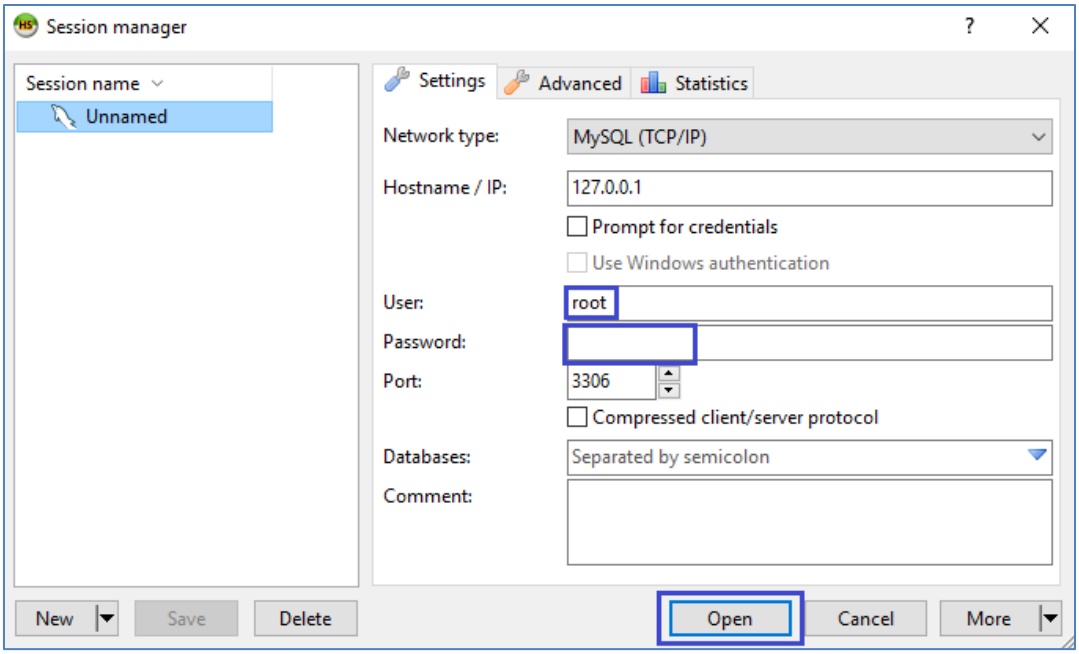
Lab: Data Definition and Data Types

This document defines the **lab exercise assignments** for the **"Databases Basics - MySQL"** course **@ Software University**.

I. Part 1. Simple Database Operations Using HeidiSQL

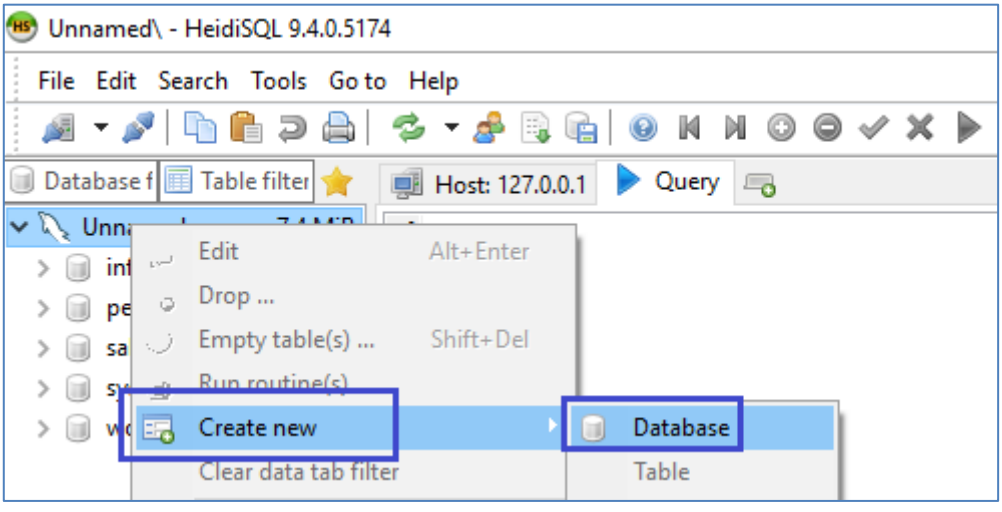
Before we start writing simple queries we are going to do some operations with the **GUI Client – HeidiSQL**. It offers us a very light and easy to use interface to create and alter database components.

Before we start we must connect to our instance with **root** and **root password**.

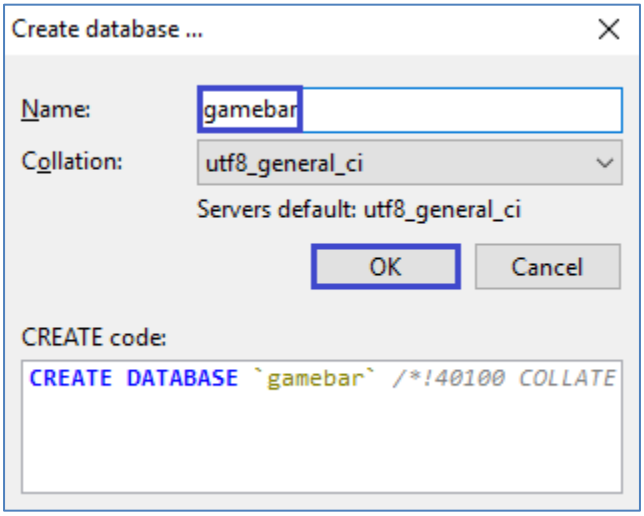


1. Create New Database

First, create an empty database gamebar. Right-click the instance you are working with and choose "**Create new**" -> "**Database**".



New "**Create Database**" window will appear. In the "**Name**" field type the name of your new database – "**gamebar**". The "Collation" menu will set the default collation for your database. **Don't change anything there for now.**



In the "**CREATE code**" field you can see the query that is about to be executed.

2. Create New Table

Right click the "**gamebar**" database that you've created in the previous problem and select "**Create New**" -> "**Table**".

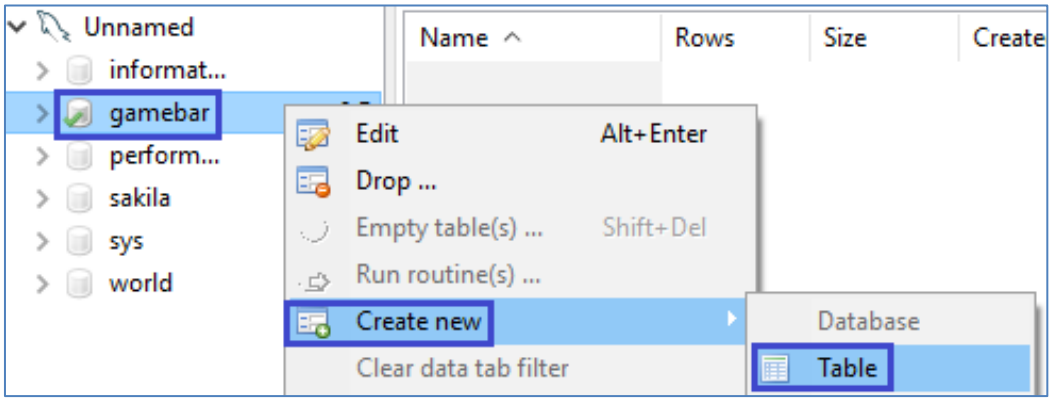
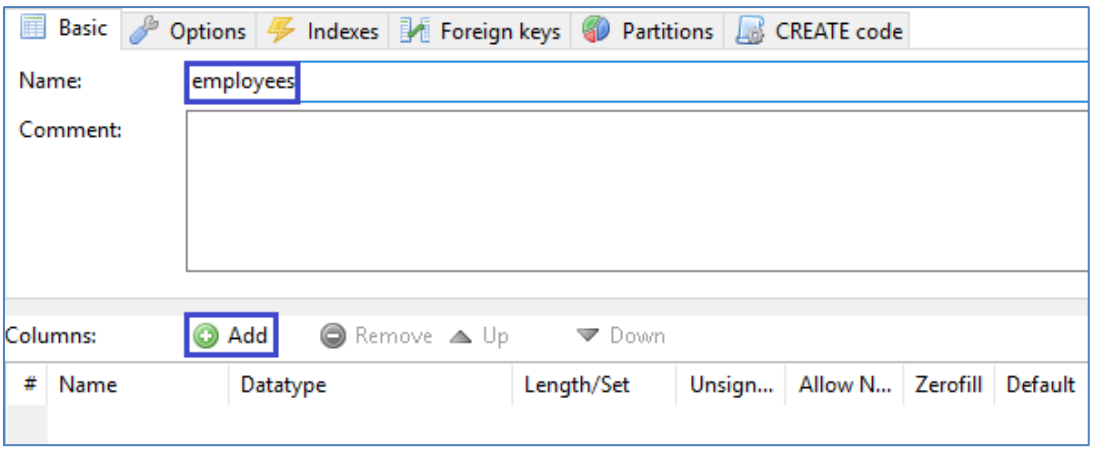
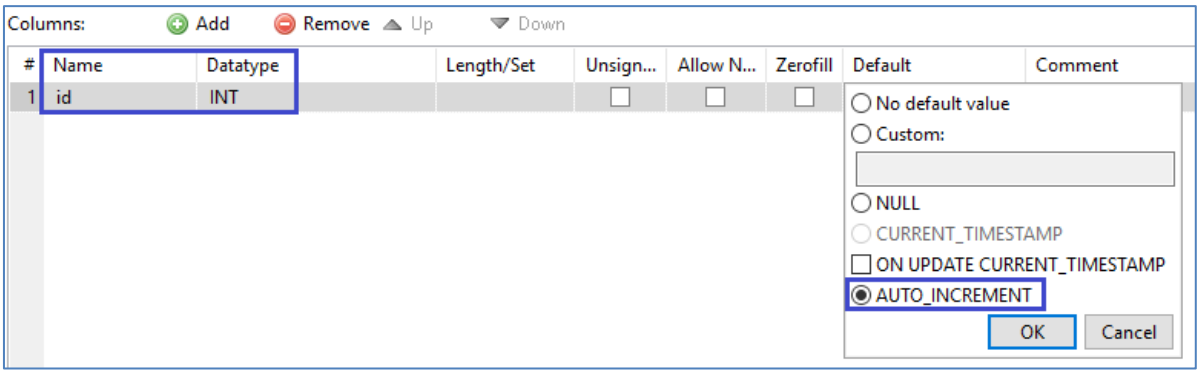


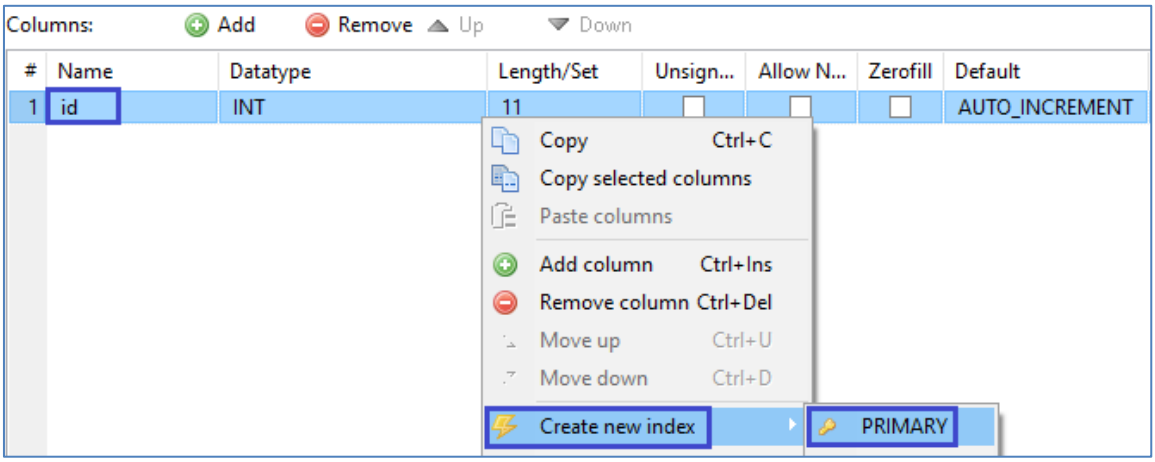
Table creation tab will appear. In the "**Name**" field type the name of your new table – "**employees**". From the "**Add**" button you can start creating your table fields.



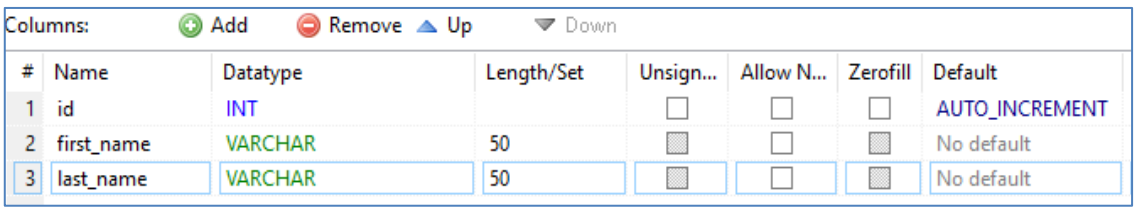
First create an "**id**" field. It will be set to **`INT`** and **`AUTO_INCREMENT`**. Select **`AUTO_INCREMENT`** from the "**Default**" field.



Make the "**id**" field to be **`primary key.`**



Create 2 more fields – "**first_name**" and "**last_name**".



Similar to "**employees**" create 2 more tables.

Table "**categories**":

- id – **INT**, **primary key**, **AUTO_INCREMENT**;
- name – **VARCHAR**, **NOT NULL**;

Table "**products**":

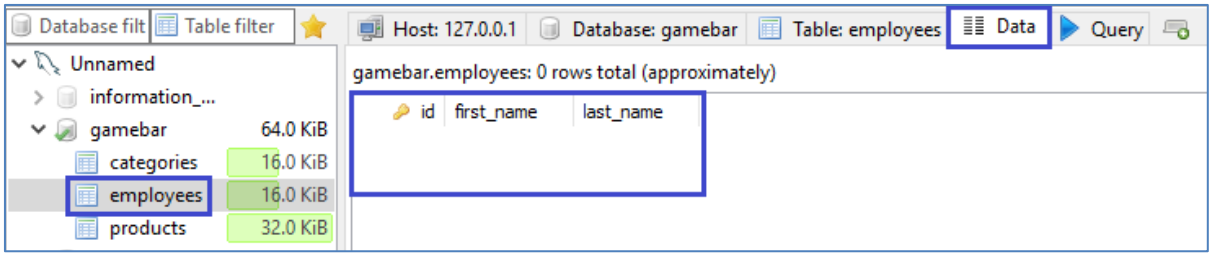
- id – **INT**, **primary key**, **AUTO_INCREMENT**;
- name – **VARCHAR**, **NOT NULL**;
- category_id – **INT**, **foreign key** referenced to the "**categories**" table (**id**)

Foreign keys are created in the "**Foreign keys**" tab. Click the "**Add**" button and specify:

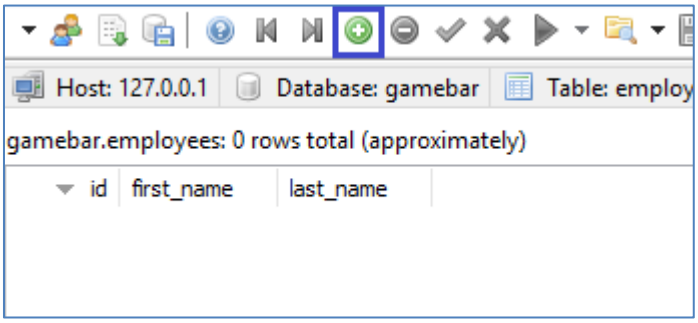
- **Columns** – select the column you want to be set as foreign key – "**category_id**";
- **Reference table** – select the table from which you will choose a column to link your foreign key – "**categories**";
- **Foreign columns** – select the column set to primary to link the foreign key – "**id**";

3. Insert Data in Tables

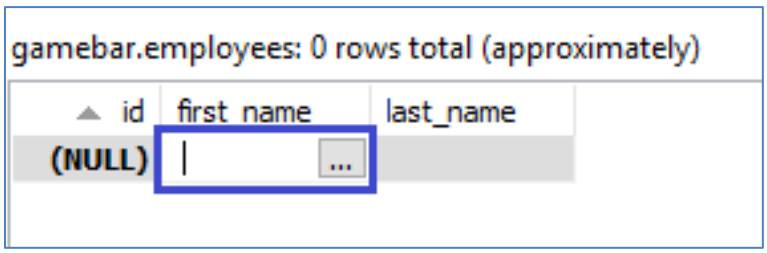
Now we can start adding some records to our newly created tables. First select the "**employees**" table. From the "**Data**" tab you can see all the records that are already inserted. Initially the table is empty.



Select the **green plus button** to add new record.

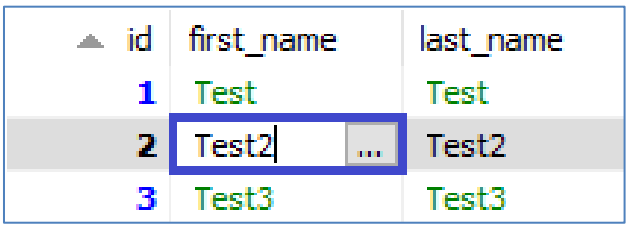


Fill in the fields with values. Create 3 records in each table.



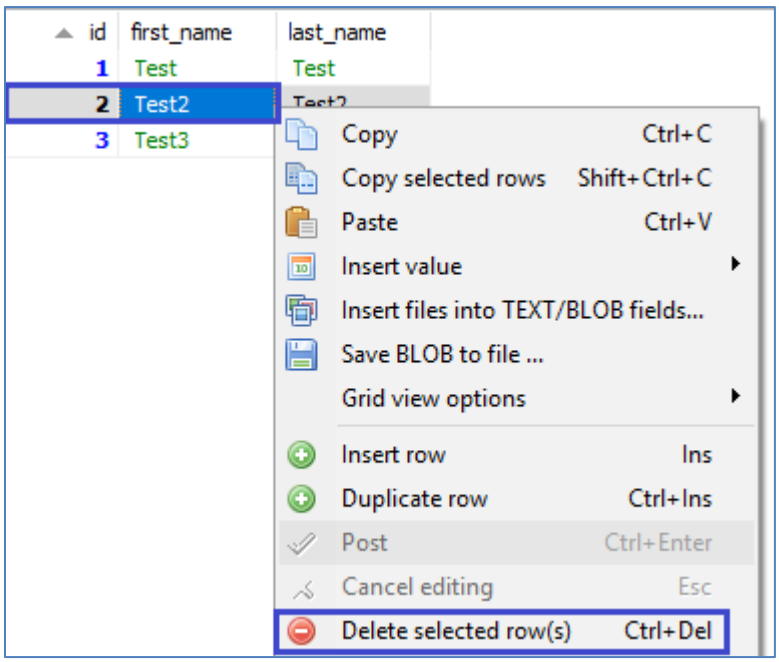
4. Editing Data

Data in tables can easily be edited with the GUI. Now that we've populated our tables with test records we can edit them by **clicking on the value field**.



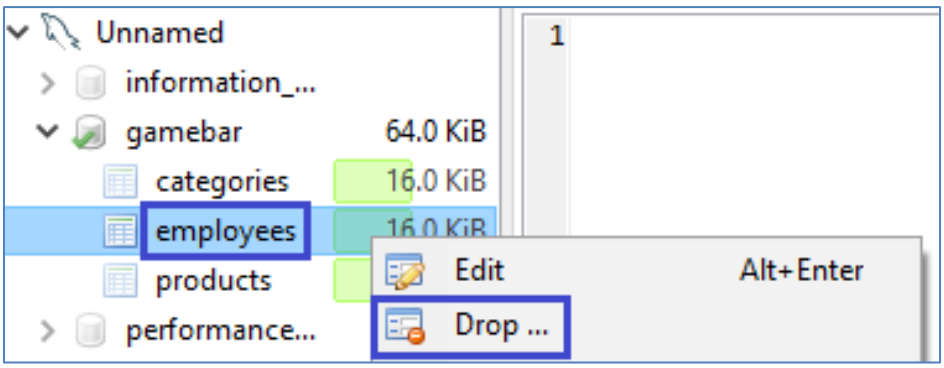
5. Deleting Data

Data deletion is easy too. We just right click the row we want to delete and select "**Delete selected row(s)**".



6. Dropping Tables

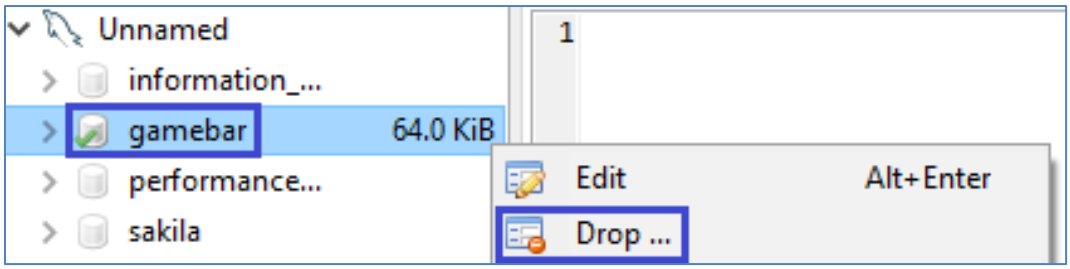
We can delete the whole table, by selecting the one we want to delete, right click and choose "**Drop…**". **You cannot undo this action.**



7. Dropping the Database

As table dropping, we can drop the database too. **This action cannot be undone too.**

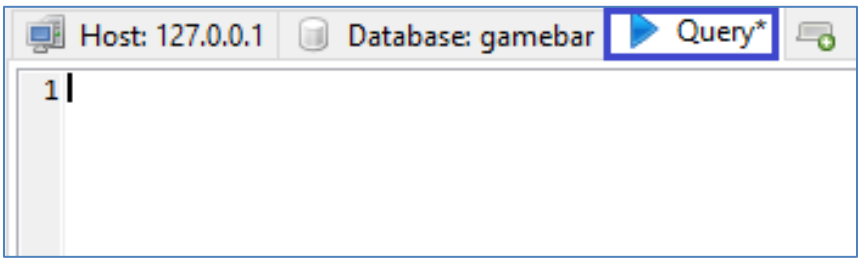
Right click the database you want to drop and select "**Drop…**".



II. Part 2. Simple Database Operations Using Queries

Now we are going to do the same steps from Part 1 using simple MySQL queries.

Queries are written in the "Query" tab.



1. Create New Database

Write a query that will create the "**gamebar**" database.

2. Create Tables

When we create tables, we specify the database we want to add them to. This is done by using the "**USE**" clause.

Submit your solutions without the "`USE {database name}`" row.

Table "**employees**":

- id – **INT**, **primary key**, **AUTO_INCREMENT**;
- first_name – **VARCHAR**, **NOT NULL**;
- last_name – **VARCHAR**, **NOT NULL**;

Create the "**categories**" and "**products**" tables analogically:

Table "**categories**":

- id – **INT**, **primary key**, **AUTO_INCREMENT**;
- name – **VARCHAR**, **NOT NULL**;

Table "**products**":

- id – **INT**, **primary key**, **AUTO_INCREMENT**;
- name – **VARCHAR**, **NOT NULL**;
- category_id – **INT**, **NOT NULL**;

3. Insert Data in Tables

Inserting data can be done with a query too. To do that we use the "**INSERT**" clause. Populate the "**employees**" table with 3 test values.

4. Altering Tables

Altering the tables is done via the "**ALTER TABLE**" clause. Add a new column – "**middle_name**" to the "**employees**" table.

5. Adding Constraints

Create the connection via foreign key between the "**products**" and "**categories**" tables that you've created earlier. Make "**category_id**" **foreign key linked to "id" in the "categories" table**.

6. Modifying Columns

Change the property "**VARCHAR(50)**" to "**VARCHAR(100)**" to the "**middle_name**" column in "**employees**" table.

7. Drop Database

Drop the "**gamebar**" database.