Database Administration

Laboratory

Part 1. Preparing MySQL Database

1. Projects

a) Splitting in groups – approx. 3 persons

b) Selecting database topic

2. Preparing database documentation

In order to get the highest grade, database should be somewhat useful in a real use case scenario.

a) Description of database purpose

Example

The university needs a database to store information about students coming to the university as part of an exchange, for example Erasmus, the subjects they choose and about the teachers of these subjects. A student can come several times as part of an exchange. The exchange takes place in semesters (winter or summer). The student chooses the subjects that he will want to pursue during the exchange. Items are assigned categories. At the end of the semester, the student must pass the course and obtain a final grade. One subject may be taught by many tutors and one tutor may teach several subjects for exchange students. Information from which university the exchange student came from should be stored in the database. Each student who comes for an exchange receives an index number and a student email. As part of the credit, he can receive a grade from A to F. At the end of one subject, he can get only one grade, unless he gets an F grade, then he can proceed to the correction. Each subject has a name and the number of ECTS points. Each presenter has his own work email. The database should store information with which teacher a given student has classes with.

The system will be used by Erasmus coordinators at the university, the dean's office, students and teachers.

b) Brief description of database tables – each person 6 tables

Example

- *teacher - the table will store information about teachers*
- *teacher_has_course - the table will store the information which teacher teaches which subjects*

c) Characteristics of database columns – primary key, foreign key, not null, unique

Example – table student

Column name	*Datatype*	*NOT NULL*	*UNIQUE*	*PRIMARY KEY*	*FOREIGN KEY*
id	*INT*	*X*	*X*	*X*	
name	*VARCHAR(65)*	*X*			
surname	*VARCHAR(65)*	*X*			
birthday	*DATE*				
email	*VARCHAR(100)*	*X*	*X*		

d) Brief description of foreign keys – which tables and which attributes of these tables

Example

Many-to-many relationship between:

- *teacher and course – 1 teacher can conduct many courses, and 1 course can be conducted by many teachers. There will be intermediate table containing id_teacher and id_course as a foreign keys.*
- *...*

One-to-many relationship between:

- *student and address – 1 student can have many addresses. Table address will contain id_student as a foreign key.*
- *...*

3. Database designing

a) Running MySQL Workbench environment

b) Connecting to MySQL database

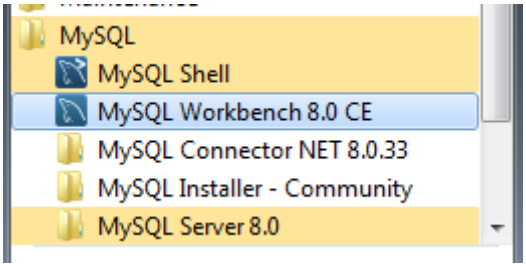
c) Graphical modeling (designing) of database tables

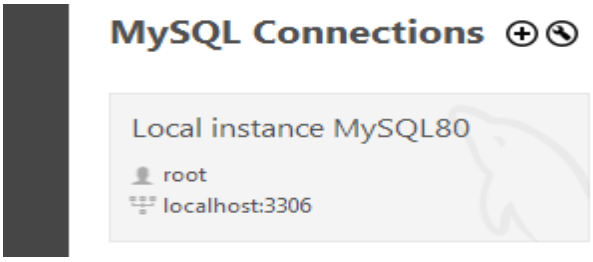
d) Graphical modeling of foreign keys (relations), including deletion policy

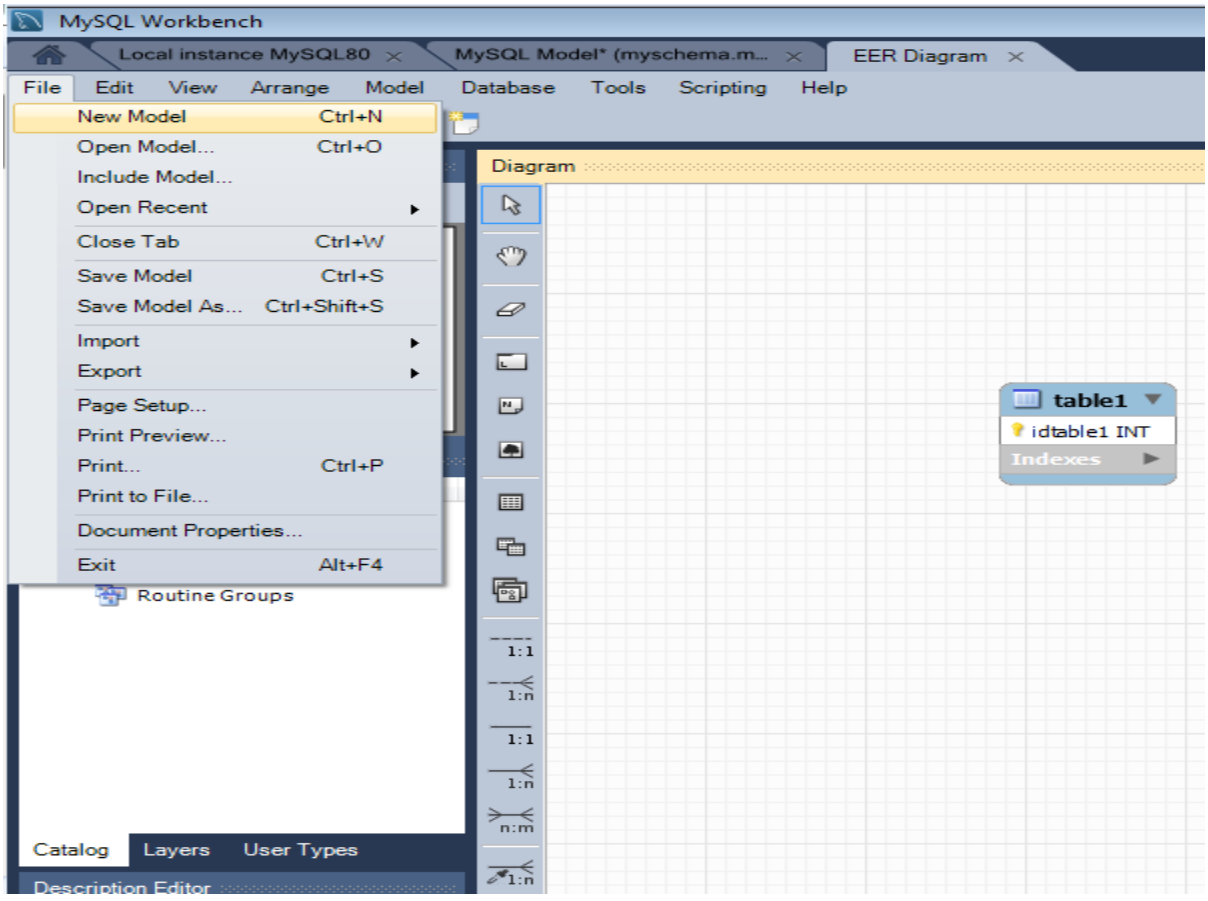
4. Database synchronization

Moved to Part 2.

HINTS


MySQL
MySQL Shell
MySQL Workbench 8.0 CE
MySQL Connector NET 8.0.33
MySQL Installer - Community
MySQL Server 8.0


MySQL Connections
Local instance MySQL80
root
localhost:3306


MySQL Workbench
Local instance MySQL80
MySQL Model* (myschema.m...
EER Diagram
File
Edit
View
Arrange
Model
Database
Tools
Scripting
Help
New Model Ctrl+N
Open Model... Ctrl+O
Include Model...
Open Recent
Close Tab Ctrl+W
Save Model Ctrl+S
Save Model As... Ctrl+Shift+S
Import
Export
Page Setup...
Print Preview...
Print... Ctrl+P
Print to File...
Document Properties...
Exit Alt+F4
Routine Groups
Diagram
table1
idtable1 INT
Indexes
1:1
1:n
1:1
1:n
n:m
1:n
Catalog
Layers
User Types
Description Editor

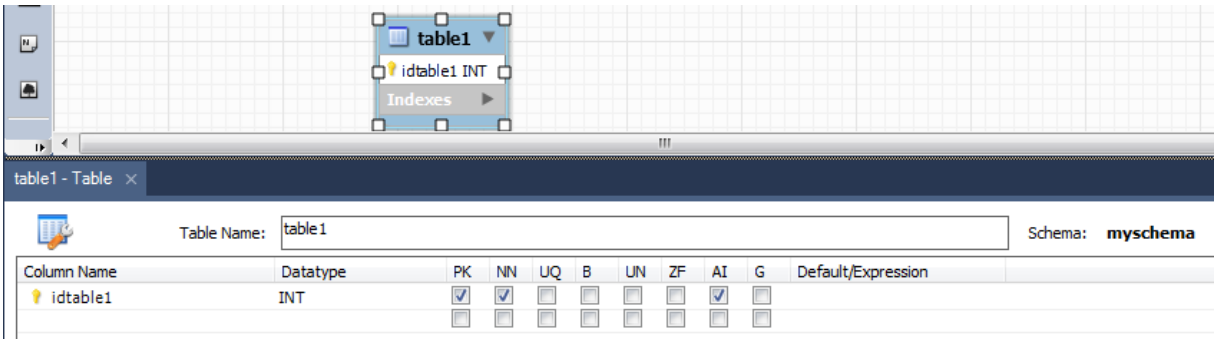


table1
idtable1 INT
Indexes
table1 - Table
Table Name:
table1
Schema:
myschema
Column Name
Datatype
PK
NN
UQ
B
UN
ZF
AI
G
Default/Expression
idtable1
INT

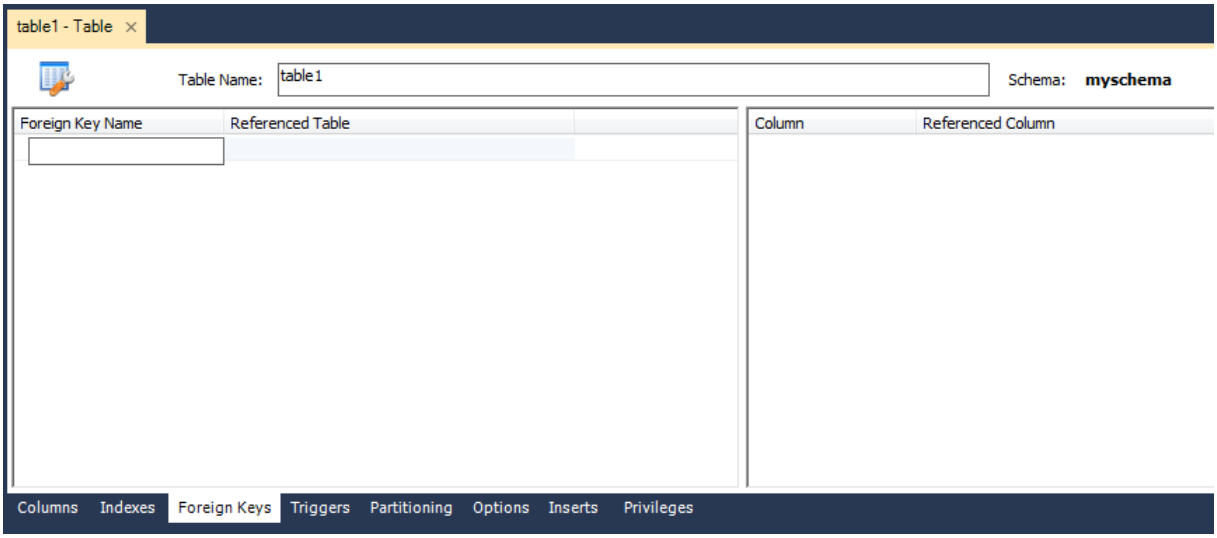
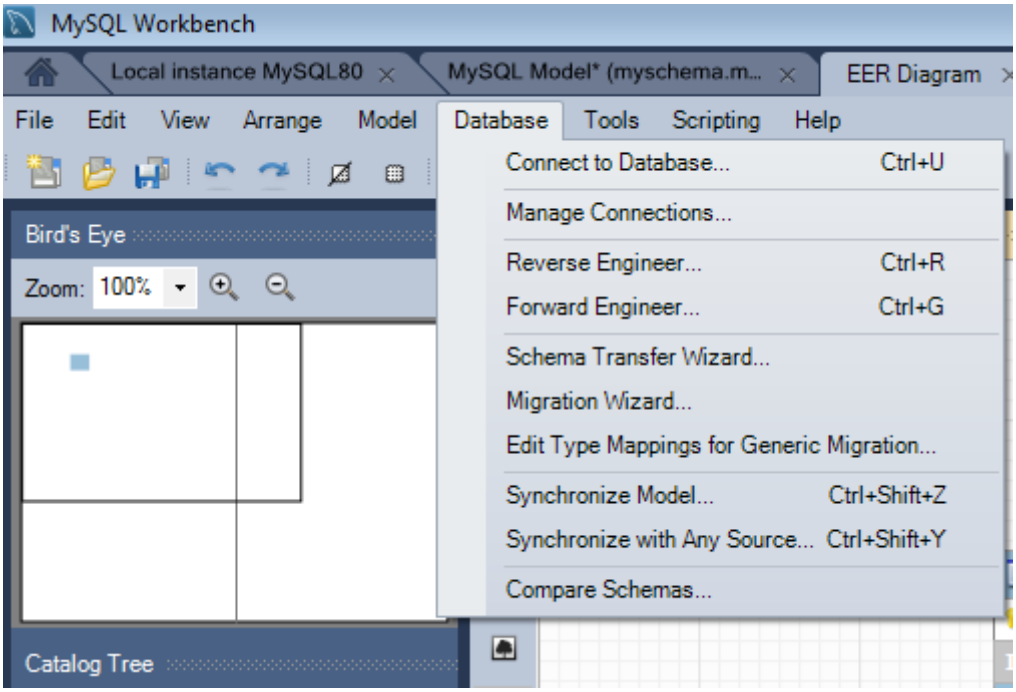


table1 - Table
Table Name:
table1
Schema:
myschema
Foreign Key Name
Referenced Table
Column
Referenced Column
Columns
Indexes
Foreign Keys
Triggers
Partitioning
Options
Inserts
Privileges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File
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View
Arrange
Model
Database
Tools
Scripting
Help
Connect to Database... Ctrl+U
Manage Connections...
Reverse Engineer... Ctrl+R
Forward Engineer... Ctrl+G
Schema Transfer Wizard...
Migration Wizard...
Edit Type Mappings for Generic Migration...
Synchronize Model... Ctrl+Shift+Z
Synchronize with Any Source... Ctrl+Shift+Y
Compare Schemas...
Bird's Eye
Zoom: 100%
Catalog Tree