

levads datu bāzēs



LATVIJAS UNIVERSITĀTE
**BIZNESĀ, VADĪBĀS
UN EKONOMIKĀS
FAKULTĀTE**

VUMC VADĪBAS UN
UZNĒMĒJDARBĪBAS
MĀCĪBU CENTRS

ESF projekts Nr. 8.4.1.0/16/I/001
"Nodarbināto personu profesionālās kompetences pilnveide"

NACIONĀLAIS
ATTĪSTĪBAS
PLĀNS 2020



EIROPAS SAVIENĪBA
Eiropas Sociālais
fonds

I E G U L D Ī J U M S T A V Ā N Ą K O T N ē



Datu bāzes un tabulu uzturēšana.

6. lekcija

Šodienas lekcijā

- Tabulu izveidošana**
- Indeksu un/vai konstreintu pievienošana**
- Patstāvīgais mājas darbs**
 - Izmantojot MySQL, izdzēst datu bāzi
 - Izveidot jaunu tabulu un izdzēst to
 - Uzdevums par kolonnu modificēšanu
 - Uzdevums par tabulas indeksu un/vai konstreintu modificēšanu



Piemēru datubāzes

VUMC

levads datu bāzēs

2022

Lejūpielādēt skriptu projektu



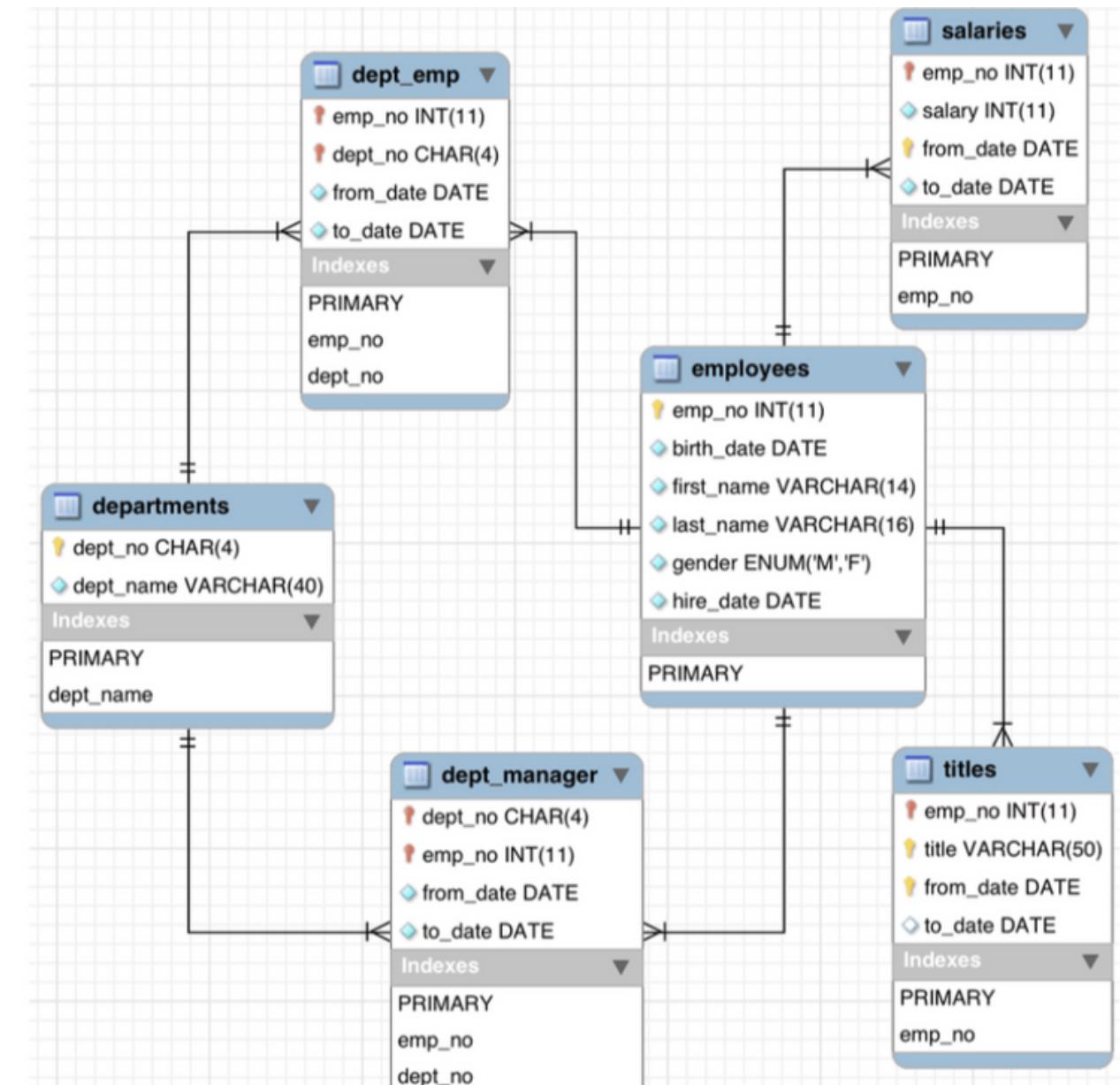
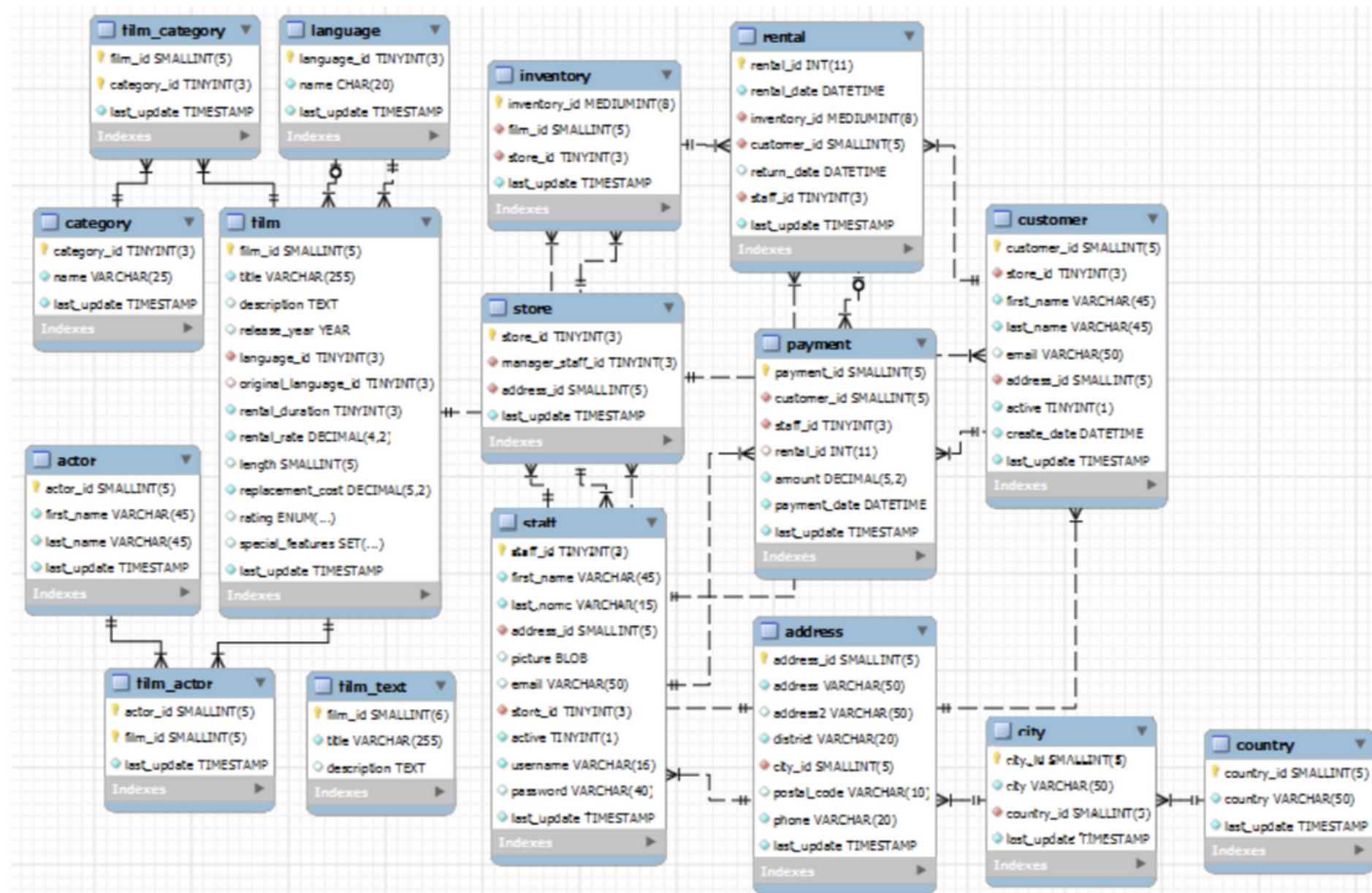
SAKILA

<https://dev.mysql.com/doc/sakila/en/>



EMPLOYEES

<https://dev.mysql.com/doc/employee/en/employees-installation.html>



Piemēru datubāzes

VUMC
levads datu bāzēs
2022

datacharmer/ **test_db**



A sample MySQL database with an integrated test suite, used to test your applications and database servers

3

Contributors

1

Issue

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Stars

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Forks



datacharmer/test_db: A sample MySQL database with an integrated test suite, used to test your applications and database servers

A sample MySQL database with an integrated test suite, used to test your applications and database servers - GitHub - datacharmer/test_db: A sample MySQL database with an integrated test suite, use...

 GitHub



Piemēru datubāžu instalēšana



- **Jābūt GIT uzinstalētam**
- **Zem windows varat lietot terminālu gitbash**

```
git clone https://github.com/datacharmer/test_db.git
```

```
cd /Users/robertspolis/workspace/mysql/test_db/
```

```
g
```

```
mysql -uadmin -p -h trainer-1.ckh4seomnuyp.eu-west-1.rds.amazonaws.com
```

```
-- SAKILA datubāzes instalēšana
source sakila/sakila-mv-schema.sql
source sakila/sakila-mv-data.sql
```

```
-- employees datubāzes instalēšana
source employees.sql
```

Tabulu veidošana kā dizaina produkts



Izmantojam MySQL Workbench ER dizaineri

- Lauj labāk saprast veidojamos objektus
- Daļa no analīzes fāzes
- Rezultātā iegūstam tabulu ER modeli
- Ar Forward Engineer noģenerējam datubāzes skriptu
- Izpildām to ar komandrindas MySQL klientu
- SQL Workbench menu File -> New model
- Ar drag uzliekam tabulu uz model redaktora
- Dubultclick un aizpildam tabulas struktūru

invoice - Table											
Column	Datatype	PK	NN	UQ	BIN	UN	ZF	AI	G	Default / Expression	
id	INT	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
line_no	INT	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
sku_id	INT	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
quantity	VARCHAR(45)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
price	DECIMAL(6,2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
amount	DECIMAL(6,2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
line_comment	VARCHAR(1024)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<click to edit>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Pievienojam modelim indeksus

► Izvēlamies tab Indeksi

► Apskatām nodefinētos indeksus

► Pievienojam jaunu indekssu ja vēlamies

invoice - Table

Name: invoice Schema: mydb

Index	Type
PRIMARY	PRIMARY
id_UNIQUE	UNIQUE
sku_code_UNIQUE	UNIQUE

<click to edit>

Index details 'sku_code_UNIQUE'

Index Columns	#	Order	Length
<input type="checkbox"/> id		ASC	◊
<input type="checkbox"/> line_no		ASC	◊
<input checked="" type="checkbox"/> sku_id	1	ASC	◊
<input type="checkbox"/> quantity		ASC	◊
<input type="checkbox"/> price		ASC	◊
<input type="checkbox"/> amount		ASC	◊
<input type="checkbox"/> line_comment		ASC	◊

Storage Type: InnoDB

Key Block Size: 0

Parser: Standard

Visibility:

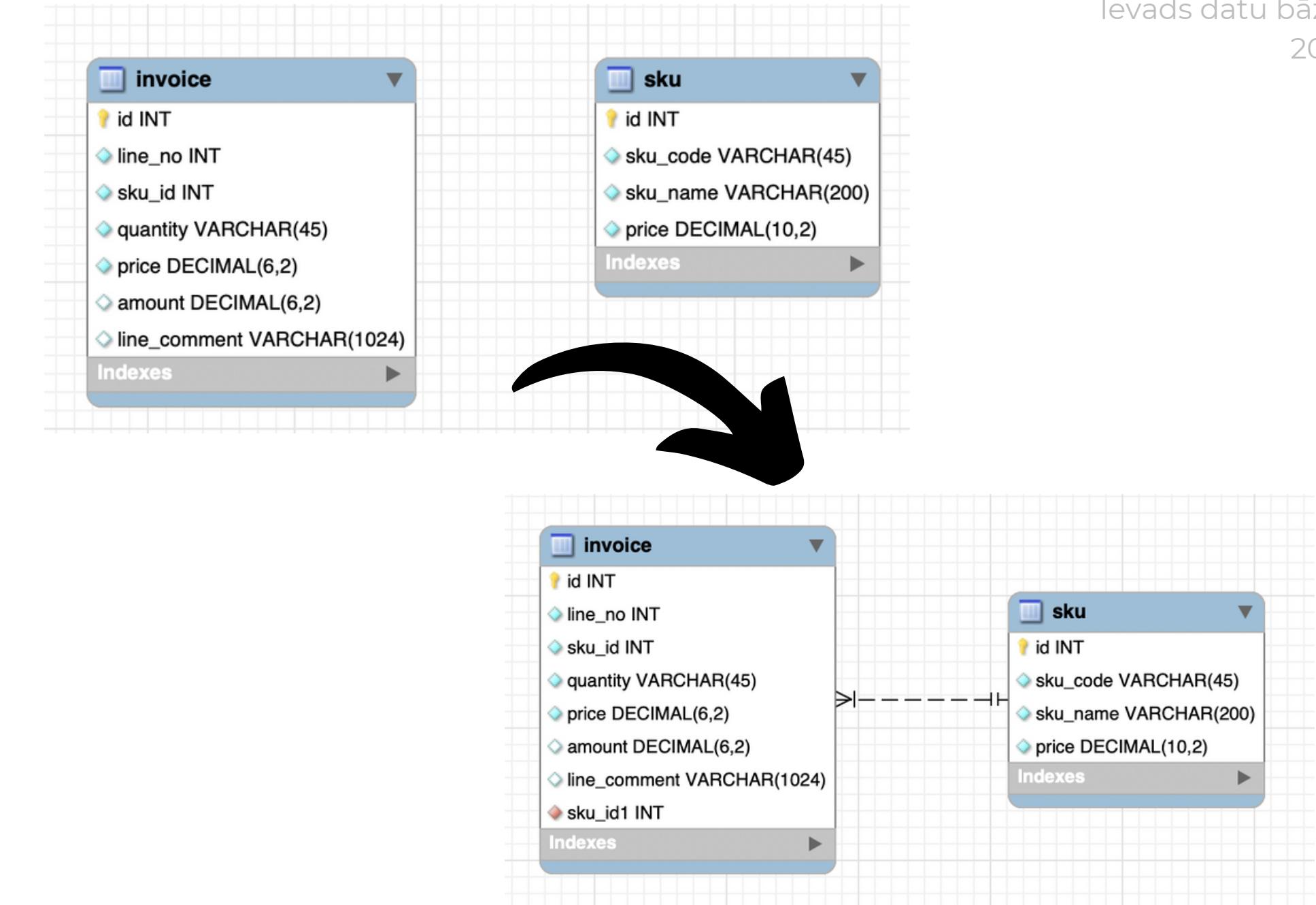
Comments:

Norādes atslēga (konstreints)

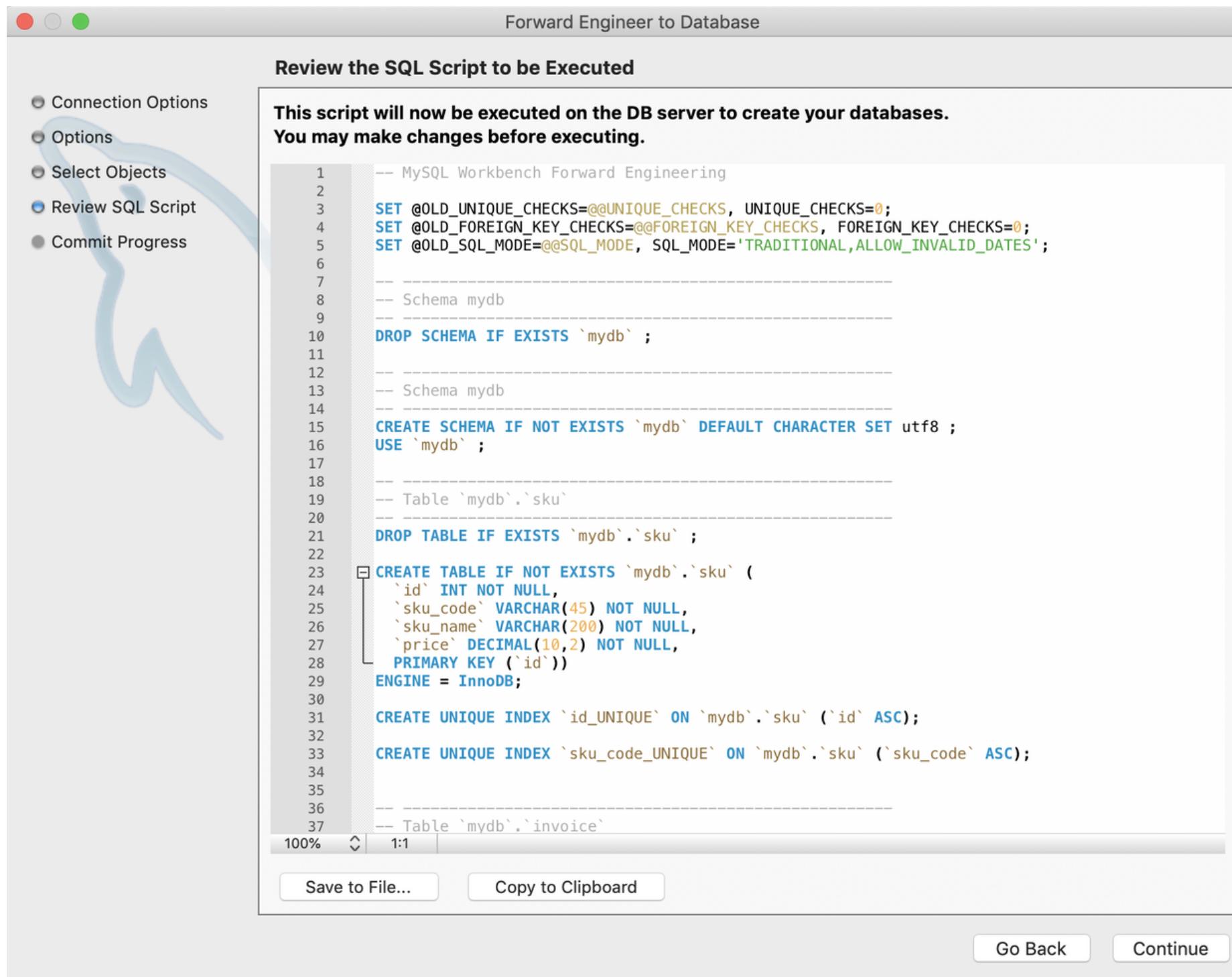


LAI PIEVIENOTU NORĀDES ATSLĒGU

- Uzklikšķina [daudz uz 1] relāciju
- Uzklikšķina [daudz] pusi
- Uzklikšķina [viens] pusi



Forward engineer



The screenshot shows the 'Forward Engineer to Database' interface in MySQL Workbench. The main window title is 'Review the SQL Script to be Executed'. A message at the top states: 'This script will now be executed on the DB server to create your databases. You may make changes before executing.' Below this is a large block of SQL code. The code starts with MySQL-specific configuration (SET @OLD_UNIQUE_CHECKS=@@UNIQUE_CHECKS, UNIQUE_CHECKS=0; etc.) and then creates a schema named 'mydb'. It drops the schema if it exists, creates it again, and sets its character set to utf8. Inside the schema, it drops and recreates a table named 'sku'. The table has columns: 'id' (INT NOT NULL), 'sku_code' (VARCHAR(45) NOT NULL), 'sku_name' (VARCHAR(200) NOT NULL), and 'price' (DECIMAL(10,2) NOT NULL). The primary key is defined as 'PRIMARY KEY (`id`)', and the engine is specified as 'InnoDB'. Finally, two unique indexes are created: 'id_UNIQUE' on the 'id' column and 'sku_code_UNIQUE' on the 'sku_code' column. At the bottom of the window, there are buttons for 'Save to File...', 'Copy to Clipboard', 'Go Back', and 'Continue'.

 **DATABASE -> FORWARD ENGINEER**

➤ Skriptā redzama :

- Shēmas veidošana
- Tabulas veidošana
- Konstreinti : Unikālās un norādes atslēgas
- Indeksu veidošana

➤ Spiežam 'continue' un Izpildām skriptu jaunā shēmā 'mydb'

➤ Jaa rodas klūda izpildam skriptu manuāli ar copy/paste metodi.

MySQL datubāzes izdzēšana

```
mysql> show databases;  
ERROR 2006 (HY000): MySQL server has gone away  
No connection. Trying to reconnect...  
Connection id: 9  
Current database: employees
```

```
+-----+  
| Database |  
+-----+  
| db1     |  
| employees |  
| fci_db   |  
| information_schema |  
| mysql    |  
| performance_schema |  
| sys      |  
+-----+  
7 rows in set (0.17 sec)
```

```
mysql> use db1;  
Reading table information for completion of table and column names  
You can turn off this feature to get a quicker startup with -A
```

```
Database changed  
mysql> show tables;  
+-----+  
| Tables_in_db1 |  
+-----+  
| employees     |  
| table2        |  
+-----+  
2 rows in set (0.00 sec)
```

```
mysql> DROP DATABASE IF EXISTS db1;  
Query OK, 2 rows affected (0.12 sec)
```



DROP DATABASE IF EXISTS db_nosaukums;

- Izdzēš tabulu struktūru un datus lepriekš ar show tables pārliecinamies ka vēlamies to darīt, jo process nav atgriezenisks
- Iespējams ar mysqldump uztaisam rezerves kopiju

SQL - Izveidot tabulu uz eksistējošas bāzes

```
mmysql> use employees;
Database changed
mysql> show tables;
+-----+
| Tables_in_employees |
+-----+
| current_dept_emp    |
| departments          |
| dept_emp             |
| dept_emp_latest_date |
| dept_manager         |
| employees            |
| salaries             |
| titles               |
+-----+
8 rows in set (0.00 sec)

mysql> describe employees;
+-----+-----+-----+-----+-----+-----+
| Field      | Type       | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| emp_no     | int        | NO   | PRI  | NULL    |       |
| birth_date | date       | NO   |       | NULL    |       |
| first_name | varchar(14) | NO   |       | NULL    |       |
| last_name  | varchar(16)  | NO   |       | NULL    |       |
| gender     | enum('M','F') | NO   |       | NULL    |       |
| hire_date  | date       | NO   |       | NULL    |       |
+-----+-----+-----+-----+-----+-----+
6 rows in set (0.02 sec)

mysql> CREATE TABLE employees_copy
-> SELECT emp_no,birth_date as emp_birth_date, first_name as emp_name
-> FROM employees;
Query OK, 300024 rows affected (1.74 sec)
Records: 300024 Duplicates: 0 Warnings: 0
```



Izmanto **CREATE TABLE** komandu ar **SELECT** uz eksistējošas tabulas(s)

➤ Izveido jaunu tabulu ar pieprasījuma rezultātu

➤ Izmanto esošās kolonas vai izveido jaunas kolonas ar AS atslēgas vārdu

SQL - temporary table

```
mysql> CREATE TEMPORARY TABLE employees_temp  
-> SELECT emp_no,birth_date as emp_birth_date, first_name as emp_name  
-> FROM employees;  
Query OK, 300024 rows affected (0.93 sec)  
Records: 300024 Duplicates: 0 Warnings: 0
```

```
mysql> select * from employees_temp LIMIT 5;  
+-----+-----+  
| emp_no | emp_birth_date | emp_name |  
+-----+-----+  
| 10001 | 1953-09-02 | Georgi |  
| 10002 | 1964-06-02 | Bezalel |  
| 10003 | 1959-12-03 | Parto |  
| 10004 | 1954-05-01 | Chirstian |  
| 10005 | 1955-01-21 | Kyoichi |  
+-----+-----+  
5 rows in set (0.01 sec)
```

```
mysql> select database();  
+-----+  
| database() |  
+-----+  
| employees |  
+-----+  
1 row in set (0.00 sec)
```

```
mysql> quit;  
Bye  
$ mysql -uroot -pqwerty -h localhost
```

```
mysql> use employees;  
  
Database changed  
mysql> select * from employees_temp LIMIT 5;  
ERROR 1146 (42S02): Table 'employees.employees_temp' doesn't exist
```



Izmantojam **CREATE TEMPORARY TABLE** tabulai, kura :

- Eksistē tikai uz klienta sesijas laiku
- Redzama tikai tam klientam kas to izveidojis
- Neietekmē citus lietotājus kas izmanto tos pašus datus
- Var izmantot lai aizvietotu oriģinālo tabulu



Izmanto temporary tables lai glabātu summāros datus

SQL - DROP TABLE

```
mysql> drop table sales_by_film_category1 , sales_by_store1;  
Query OK, 0 rows affected (0.07 sec)
```

```
mysql> drop table if exists staff_list1;  
Query OK, 0 rows affected (0.05 sec)
```

```
mysql> drop temporary table temp_customer_list;  
Query OK, 0 rows affected (0.05 sec)
```

 **Sintakse : DROP TABLE tabulas_nosaukums**

 **Izdzēš tabulas struktūru un datus**

 **Nav atgriezeniska**

SQL - pievienot kolonu



ALTER TABLE ADD COLUMN kol_nosaukums kol_tips

```
mysql> alter table employees add column comments varchar(1000);
Query OK, 0 rows affected (0.07 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

SQL - pievienot konstreintus



INDEKSA PIEVIENOŠANA :

ALTER TABLE table_name ADD INDEX [index_name] (index_columns);



UNIKĀLĀS ATSLĒGAS PIEVIENOŠANA :

ALTER TABLE table_name ADD UNIQUE [index_name] (index_columns);



PRIMĀRĀS ATSLĒGAS PIEVIENOŠANA :

ALTER TABLE table_name ADD PRIMARY KEY (index_columns);

mysql>

SQL - pievienot norādes atslēgu

The screenshot shows the MySQL Workbench interface. On the left, there's a tree view of database objects under 'dept_emp'. A blue bar highlights 'dept_emp_ibfk_1'. Below the tree, tabs for 'Object Info' and 'Session' are visible. Under 'Object Info', it says 'Foreign Key: dept_emp_ibfk_1'. The 'Definition:' section contains the following details:

Target	employees (emp_no → emp_no)
On Update	RESTRICT
On Delete	CASCADE

```
mysql> select count(*) from dept_emp;
+-----+
| count(*) |
+-----+
| 245896 |
+-----+
1 row in set (0.01 sec)

mysql> delete from employees;
Query OK, 300023 rows affected (21.29 sec)

mysql> select count(*) from dept_emp;
+-----+
| count(*) |
+-----+
|    0    |
+-----+
1 row in set (0.03 sec)
```



Sintakse :

ALTER TABLE tabulas_nosaukums

ADD FOREIGN KEY (atslegas_nosaukums)

REFERENCES tabulas_nosaukums (kolonas_nosaukums)



Norādes atslēga garantē ka bērna ierakstam eksistē
vecāka ieraksts.

Piemērs: Employee ir piešķirts eksistējošs departaments.

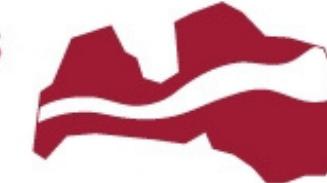


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