

B0B36DBS, BD6B36DBS: **Database Systems**

<http://www.ksi.mff.cuni.cz/~svoboda/courses/172-B0B36DBS/>

Practical Class 5

SQL: Data Definition

Author: **Martin Svoboda**, martin.svoboda@fel.cvut.cz

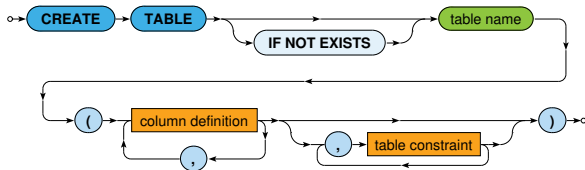
Tutors: **J. Ahmad**, **R. Černoch**, **M. Řimnáč**, **M. Svoboda**, **G. Šourek**

20. 3. 2018

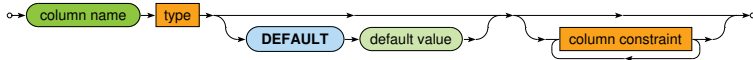
Czech Technical University in Prague, Faculty of Electrical Engineering

Tables

CREATE TABLE statement

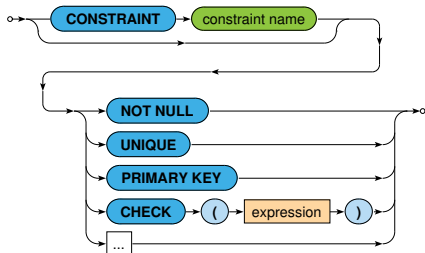


Column definition

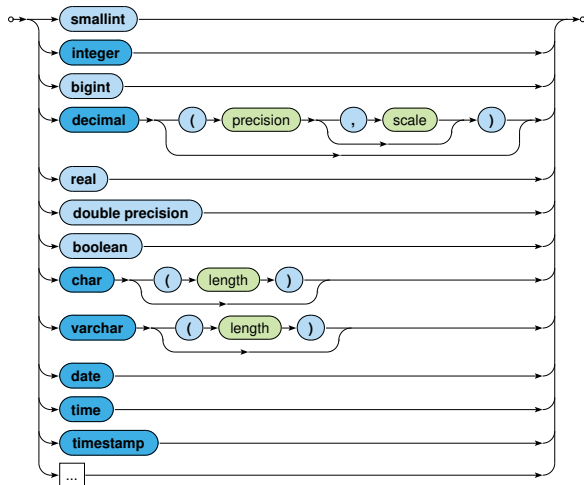


Integrity Constraints

Column-level constraint definition



Data Types



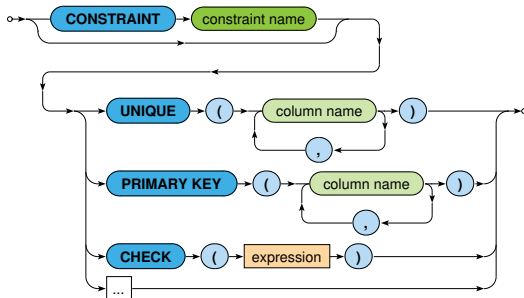
Exercise 1

Create a schema for the following table

- **Library (Name, Street, City, PostalCode)**
- Choose appropriate data types
- Define primary key and NOT NULL constraints
 - Use column-level constraints only

Integrity Constraints

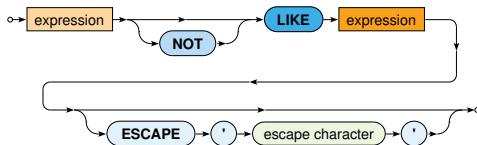
Table-level constraint definition



Exercise 2

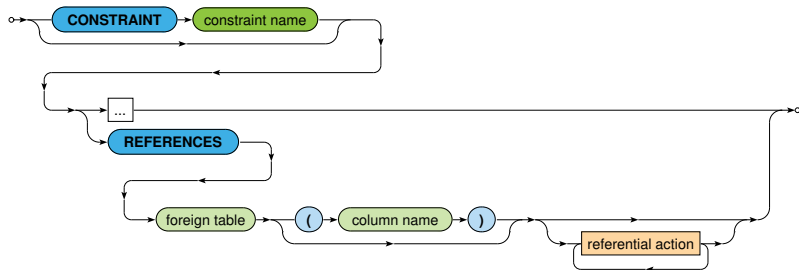
Create a schema for the following table

- **Client (Card, FirstName, LastName, Email, DateOfBirth)**
 - Card is a 16 digit long user card identification number
 - Date of birth is just optional
- Describe all basic integrity constraints
 - Use table-level constraints only
- Check well-formedness of email addresses
 - Use LIKE predicate



Foreign Keys

Column-level constraint definition (cont.)



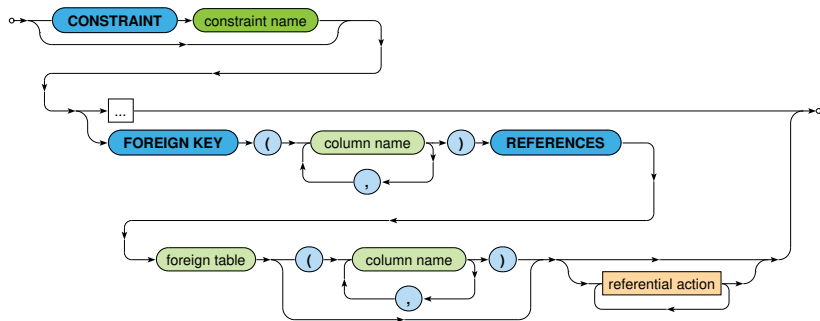
Exercise 3

Create a schema for the following table

- **Phone (Client, Number)**
Client $\subseteq$ Client (Card)
 - Phone numbers are always 9 digits long
- Describe referential integrity
 - Use a column-level constraint for this purpose

Foreign Keys

Table-level constraint definition (cont.)



Exercise 4

Create a schema for the following tables

- **Title (IdTitle, ISBN, Title)**
 - Id is an artificially generated integer identifier
 - ISBN identifiers are at most 17 characters long
 - Preserve both the relational keys
- **Author (IdAuthor, Name, YearOfBirth, YearOfDeath)**
 - Both years of birth and death are optional
 - Check mutual consistency of their values
- **Authorship(Title, Author)**

Title $\subseteq$ Title (IdTitle)
Author $\subseteq$ Author (IdAuthor)

 - Use table-level constraints for the referential integrity

Table Modifications

ALTER TABLE statement

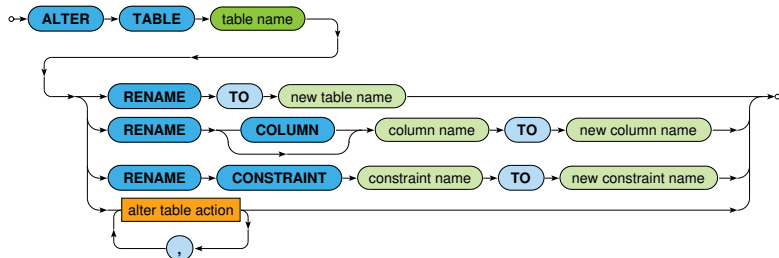
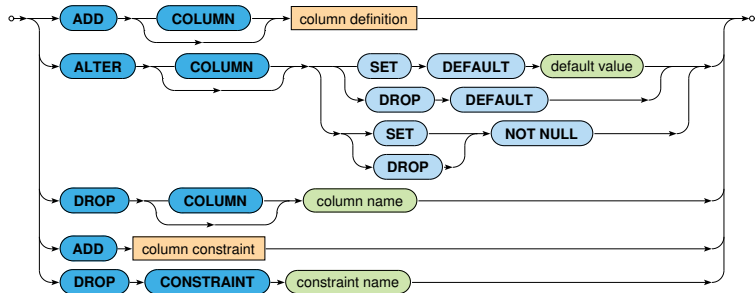


Table Modifications

ALTER TABLE modification action



Exercise 5

Alter schema of a table for libraries

- Add *IdLibrary* as a new primary key of libraries
- Preserve uniqueness of the former *name* column

Exercise 6

Create a schema for the following table

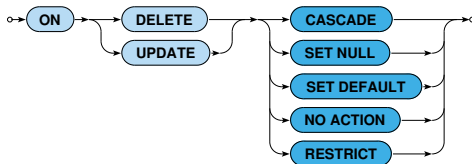
- **Book (Library, Signature, Title, DateOfAddition)**

Library $\subseteq$ Library (IdLibrary)

Title $\subseteq$ Title (IdTitle)

Referential Actions

Foreign key **referential action**



Exercise 7

Create a schema for the following table

- **Loan (IdLoan, Client, Library, Signature, TimeLoaned, DateReturned)**

Client $\subseteq$ Client (Card)

(Library, Signature) $\subseteq$ Book (Library, Signature)

- Date of return is filled in only after successfully returned
- Add suitable referential actions
 - I.e. when a book / client is...
 - updated, then the corresponding loans will be updated, too
 - removed, then the corresponding loans will be preserved

Database Connection

Connection details

- *Host:* slon.felk.cvut.cz
- *Port:* [5432](#)
- *Database, user, and password:* sent by e-mail

PostgreSQL

- Open-source ORDBMS
- <https://www.postgresql.org/>

pgAdmin4

- PostgreSQL administration and development platform
- <https://www.pgadmin.org/>