

Übung Informationssysteme 1 2019w SQL Part 2

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Technical Guidelines

The course information system is implemented in an Oracle database. You can use two alternative connection types.

1) Oracle SQL Developer

The client software "Oracle SQL Developer" is currently available for Windows, macOS and Linux. The "Oracle SQL Developer" (e.g., Windows 64-bit with JDK included) has to be downloaded from the Oracle website (<https://www.oracle.com/technetwork/developer-tools/sql-developer/downloads/index.html>) and installed on your PC. In Windows, after unzipping the downloaded file, you can immediately start "sqldeveloper.exe" without any further installation procedure.

Create a new database connection (green +-Symbol at the upper left side of the window) and connect to the database:

Verbindungsname (connection): choose a name for the connection by your own
Benutzername (user): infosys

Kennwort (password): infosys

Hostname (host): infosys.faw.jku.at

Port: 1521

SID: infosys

After you are successfully connected to the database, you can create and execute SQL statements in the "Query Builder" frame.

2) Oracle iSQLPlus

iSQLPlus allows to connect to the database by using a web browser.

Unfortunately, the iSQLPlus service is not very stable when too many users are connected simultaneously. Thus, the iSQLPlus service is automatically restarted every hour. Normally, when the iSQLPlus service is down, you can still connect to the database using Oracle SQL Developer. If iSQLPlus is not available for a longer time, please contact Prof. Wolfram Wöß (wolfram.woess@jku.at).

Connection:
<http://infosys.faw.jku.at/isqlplus/>
Benutzername (user): infosys
Kennwort (password): infosys
Connect-Bezeichner: infosys

Course Information System

The JKU stores data about courses of the SS 2030 in an information system with the following four relations: LVA (course), Person (lecturer), Abhaltung (appointment), and Raum (room).

LVANr is structured as follows: the first 3 digits correspond to the institute number and the first 4 digits correspond to the department number. The institutes with the number 311, 312, and 321 comprise the entire area of "Computer Science". Course types are VO (Vorlesung / lecture), UE (Übung / exercise), SE (Seminar / seminar), PR (Praktikum / practical course).

The table "Abhaltung" (appointment) is based on the calendar day. Thus, for each appointment a course takes place, there is one entry in the table.

Relation name	Attribute	Type	Remarks	English
LVA (course)	LVANr	varchar2(6)	312704	course number
	Name	varchar2(50)		course title
	Std	number(2)		weekly hours
	Typ	char(2)	VO, UE, SE, ...	type (lecture, ...)
Person (lecturer)	PersNr	varchar2(4)	Personal-Nummer	person id
	Name	varchar2(50)	Name	name
Abhaltung (appointment)	LVANr	varchar2(6)		course number
	PersNr	varchar2(4)		person id
	Tag	date	Kalender-Tag	date (calendar day)
	Von_Stunde	number(2)		start hour
	Von_Minute	number(2)		start minute
	Bis_Stunde	number(2)		end hour
	Bis_Minute	number(2)		end minute
	Raum_Id	varchar2(8)		room id
Raum (room)	Raum_Id	varchar2(8)	Raum-Nummer	room id
	Name	varchar2(30)	Raumbezeichnung	room name
	AnzPers	number(4)		number of persons
	Gebaeude	varchar2(20)		name of building

Exercises

Create and execute the following SQL statements. You have to submit the SQL statement as well as the result set (output) including the number of rows in the result set. Please consider that the layout of the output should be easy to read (one line for one row).

- 6.9. Create a list of all rooms (room name and number of persons) in building "TNF-Turm" that have the maximum number of persons in this building. Order the result set by room name. (4 points)
- 6.10. Create a list that compares buildings in terms of their total room capacity. The result should contain buildings (name), total number of persons in all rooms of the building, in descending order by room capacity. (4 points)
- 6.11. Create a list of all Computer Science courses and the corresponding number of appointments (course number, course name, number of appointments). Limit the list to courses with 60 to 100 appointments in descending order according to the number of appointments. (5 points)
- 6.12. Create a list of all seminars with the maximum appointment duration. The result set should contain the name of the seminar, date, start time, end time, and the lecturer's name in ascending order of seminar name. The output format for time should be hh:mm (e.g., "9:15", "10:0"). The concatenation operator `||` allows to concatenate strings, e.g. 'Name is ' || last_name. (6 p.)
- 6.13. Create a list of the last course (date, course number, course title, end time) in room "T 1010" of each day of the week 10 - 14 June 2030 and order the results by date. (6 points)
- 6.14. Create a list of all courses (name) in the period from 20 to 25 April 2030 held by the FAW institute (course number begins with "3127") in alphabetical order and without duplicates. (2 points)

Create a view based on that query with the name "FAW_Courses". Attention: This operation cannot be executed in the Oracle database since you do not have the "create view" privilege. Destructive student(s) attacked the database server and therefore student privileges had to be limited to "select". (2 points)
Delete the View "FAW_Courses". (1 point)
- 6.15. Create a list of all course appointments held by Wolfram Wöß in March 2030, including the lecturer's name, course number, course name, type, date, and room id. The output format is defined in the following paragraph. (2 points)

Assume that your query result is persisted in the database as table "CourseAppointments" with the columns "lecturer", "courseNo", "courseTitle", "type", "date", "roomId".

CourseAppointments ({lecturer, courseNo, courseTitle, type, date, roomId}, {courseNo → courseTitle type}).

- a) What is the primary key of table "CourseAppointments"? (1 point)
- b) In which normal form is table "CourseAppointments"? (1 point)
- c) Rename the course "Übung Informationssysteme 1" to "Exercises Information Systems 1". This operation cannot be executed in the Oracle database (see comments above in 6.14). (2 points)
- d) What are the consequences of that update concerning anomalies and consistency of the entire course database? (2 points)