

Übung Datenbanken und Informationssysteme 1 2022w

SQL Part 2

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Submission 12.01.2023, 13:00

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 and installed on your PC. In Windows, after unzipping the downloaded file, you can immediately start "sqldeveloper.exe" without any further installation procedure.

(<https://www.oracle.com/tools/downloads/sqldev-downloads.html>)

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 (more than half a day), please contact Prof. Dr. 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 courses (course number, course title, weekly hours) that have the maximum number of weekly hours. Seminars should not be considered. Sort the result set in ascending order by course title. (5 points)
- 6.10. Create a list that compares buildings in terms of their total number of rooms. The result should contain buildings (name) and total number of rooms in the building, in descending order by number of rooms. Limit the list to buildings with 10-30 rooms. (4 points)
- 6.11. Create a list of all "Computer Science" courses starting at 18:15 or later with the corresponding number of appointments (course number, course name, start time, end time, number of appointments). Limit the list to courses with less than 30 appointments in descending order according by the number of appointments. (6 points)
- 6.12. Create a list of all courses held by Künig Josef with the shortest (minimum) appointment duration. The result set should contain the name of the course, date, start time, end time and the lecturer's name in ascending order by course title. 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 points)
- 6.13. Create a list of the latest ending courses in the evening (date, course number, course title, start time, end time) in room "T 212" for each day in the period 15-19 April 2030 and order the results by date. (6 points)
- 6.14. Create a list of all courses with two weekly hours (name, course number, weekly hours) in the period 01-15 May 2030 held by the FAW institute (course number begins with "3127") in alphabetical order by name and without duplicates. (3 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 "Wöß Wolfram" in May 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 "Übung Datenbanken und Informationssysteme 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)