Sheet 09

Exercise 1

Answer the following questions on our university database using SQL:

a) Calculate how many lectures each student is attending. Students who do not attend any lecture should be included in the result as well (\textit{attend\_count} = 0) (use outer joins).

b) Figure out how many students each professor knows: A professor knows students from one of their lectures or via a test they have supervised. Include professors not knowing any students and use outer joins. Hint: \[1\]

Exercise 2

Create SQL DML statements for the following tasks:

a) “Professor meeting”: Move all professors to room 419.

b) “Lazy students”: Remove all students from the database who have ever failed a test (grade worse than 4.0).

Exercise 3

Find those students who have attended all lectures that they wrote a test in.

Exercise 4

Considering the following table definitions:

1) \texttt{create table A(a int primary key);}
\texttt{create table B(b int);}

2) \texttt{create table A(a int primary key);}
\texttt{create table B(b int references A(a));}

Assuming the cardinalities (number of tuples) of the relation \textit{A} and \textit{B} are \(|A|\) and \(|B|\), respectively. How many tuples are produced by the following queries. If no exact estimate is possible, give an range. Alternatively you can use mathematical set operations.

a) \texttt{select * from A, B;}

b) \texttt{select * from A join B on A.a = B.b;}

c) \texttt{select * from A left outer join B on A.a = B.b;}

d) \texttt{select * from A right outer join B on A.a = B.b;}

e) \texttt{select * from A full outer join B on A.a = B.b;}

\[1\]Remember that SQL has set operations.