So far in this course, we've covered the mathematical model behind relational databases, and you've become skilled at writing queries in Relational Algebra. In the next few weeks, we will study SQL, a special-purpose programming language used to interact with real-world databases. To get started, please read the section in our Readings called Introduction to SQL (also linked from the Lectures page on Quercus).

In this Lecture Prep, you'll practice writing simple queries in SQL. The main purpose is not to test your ability to write interesting queries (these questions are simpler than many of the RA exercises you've completed), but instead to get you comfortable with the syntax of SQL. MarkUs understands SQL syntax, so simply enter valid SQL queries to solve each problem.

The schema used in this Prep consists of two relations.

- country(code, name, continent, population): each tuple represents a country with a three-letter code, a name, the continent it is on, and its population.
- countrylanguage(countrycode, countrylanguage, isofficial, percentage): 'countrycode' refers to the code attribute of a country, 'countrylanguage' is a language spoken in that country, 'isofficial' is a boolean representing whether or not 'countrylanguage' is the official language of the country, and 'percentage' is the percentage of the country's population that speaks that language. 'countrycode' and 'countrylanguage' together form the key of this table.

There is also a foreign key constraint countrylanguage[countrycode] $\subseteq$ country[code].

The data used in this prep is real data from Statistics Finland.

The queries in this prep are intended to be solved using only what you are taught in the reading and the prep itself. You do not need to look up any additional features of SQL.

Important!! None of the queries require joining more than two tables. Larger queries may cause serious performance issues. (For example, consider how many rows are in the result of joining 4 tables even if they have only 100 rows each.)

How to Submit

Enter your answers into **prep4.txt**: your answers should all be placed under the line of `---`s. For example, your answers should look as follows:

```
================================================================================

[Q1] The question will be asked here.

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ENTER YOUR ANSWER HERE

================================================================================
```

You may run the automated self-tests on MarkUs in order to check the correctness of your answers. To do this, submit your prep4.txt and then click on the "Automated Testing" tab. Click "Run tests": your results should appear after a few minutes.

Country Schema

country(code, name, continent, population)

countrylanguage(countrycode, countrylanguage, isofficial, percentage)

countrylanguage[countrycode] $\subseteq$ country[code]