



Prep 4 - Part 1 of 1

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 (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. The PCRS understands SQL syntax, so simply enter valid SQL queries to solve each problem.

Schema

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 $\text{countrylanguage}[\text{countrycode}] \subseteq \text{country}[\text{code}]$, although it is not shown in the schema below.

The data used in this prep is real data from [Statistics Finland](#).

Getting ready

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.)

Canada Code



```
country(code, name, continent, population)
countrylanguage(countrycode, countrylanguage, isofficial,
percentage)
```

Write a SQL query to report the code of the country named 'Canada'. Don't forget the semicolon at the end of your SQL statement, and that SQL requires single quotes on strings.

```
1 select code| from country where name = 'Canada';
```

History

Submit

✓ Your submission is correct!

✓ Test Case Passed

Expected Result is Hidden

Actual

code

CAN

French Countries



country(code, name, continent, population)
countrylanguage(countrycode, countrylanguage, isofficial, percentage)

Report the code of every country where 'French' is an official language.

```
1 select countrycode from countrylanguage where  
countrylanguage = 'French' and isofficial = true;
```

History

Submit

✓ Your submission is correct!

✓ Test Case Passed

Expected Result is Hidden

Actual

countrycode

MCO

FRA

SPM

BEL

BDI

GLP

HTI

CAN

MDG

MTQ

MYT

PYF

RWA

CHE

NCL

SYC

VUT

LUX

German Country Names



country(code, name, continent, population)

countrylanguage(countrycode, countrylanguage, isofficial, percentage)

Report the name and continent (in that order) of all countries where 'German' is spoken, not necessarily as the official language.

```
1 select name, continent from country cross join
  countrylanguage where code = countrycode and
  countrylanguage = 'German';
```

HistorySubmit

✓ Your submission is correct!

✓ Test Case Passed

Expected Result is Hidden

Actual

name	continent
Australia	Oceania
Belgium	Europe

Brazil	South America
Italy	Europe
Austria	Europe
Canada	North America
Kazakstan	Asia
Liechtenstein	Europe
Luxembourg	Europe
Namibia	Africa
Paraguay	South America
Poland	Europe
Romania	Europe
Germany	Europe
Switzerland	Europe
Denmark	Europe
Czech Republic	Europe
Hungary	Europe
United States	North America

European Populations



```
country(code, name, continent, population)
countrylanguage(countrycode, countrylanguage, isofficial,
percentage)
```

Report the name and population of each country in 'Europe', ordered by their population, with the most-populated country appearing first.

```
1 select name, population from country where
continent = 'Europe' order by population desc;
```

[History](#)[Submit](#)

✓ Your submission is correct!

✓ Test Case Passed

Expected Result is Hidden

Actual

name	population
Russian Federation	146934000
Germany	82164700
United Kingdom	59623400
France	59225700
Italy	57680000
Ukraine	50456000
Spain	39441700
Poland	38653600
Romania	22455500
Netherlands	15864000
Yugoslavia	10640000
Greece	10545700
Czech Republic	10278100
Belgium	10239000
Belarus	10236000
Hungary	10043200
Portugal	9997600
Sweden	8861400
Bulgaria	8190900

Austria	8091800
Switzerland	7160400
Slovakia	5398700
Denmark	5330000
Finland	5171300
Norway	4478500
Croatia	4473000
Moldova	4380000
Bosnia and Herzegovina	3972000
Ireland	3775100
Lithuania	3698500
Albania	3401200
Latvia	2424200
Macedonia	2024000
Slovenia	1987800
Estonia	1439200
Luxembourg	435700
Malta	380200
Iceland	279000
Andorra	78000
Faroe Islands	43000
Monaco	34000
Liechtenstein	32300
San Marino	27000
Gibraltar	25000
Svalbard and Jan Mayen	3200

Holy See (Vatican City State)

1000



Bilingual

```
country(code, name, continent, population)
countrylanguage(countrycode, countrylanguage, isofficial,
percentage)
```

Report the code of every country where at least two different languages are spoken. Rename the column to "bilingualcode". We use the keyword "as" to rename a column. For example:

```
select code as a, name as b
from country;
```

We encourage you to use a self-join to do this question, but in order to do this you'll need to rename a table. The table-renaming syntax is simply to include a new table name after the old one. For example (this one is not a self-join):

```
select *
from country c, language l
where c.code = l.countrycode;
```

Note that the FROM clause above might look like a Cartesian product of four tables; pay attention to commas!

Do not try to eliminate duplicates from your results.

```
1 select c1.countrycode as bilingualcode from
countrylanguage c1, countrylanguage c2 where
c1.countrycode = c2.countrycode and
c1.countrylanguage != c2.countrylanguage;
```

HistorySubmit

✓ Your submission is correct!

✓ Test Case Passed

Expected Result is Hidden

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Distinct Bilingual



country(code, name, continent, population)

countrylanguage(countrycode, countrylanguage, isofficial,
percentage)

Report the code of every country where at least two different languages are spoken. Rename the column to "bilingualcode".

For this question, eliminate duplicates from your results by using "select distinct" instead of just "select".

```
1 select distinct c1.countrycode as bilingualcode  
  from countrylanguage c1, countrylanguage c2 where  
    c1.countrycode = c2.countrycode and  
    c1.countrylanguage != c2.countrylanguage;
```

History

Submit

✓ Your submission is correct!

✓ Test Case Passed

Expected Result is Hidden

Actual

bilingualcode

MDG

PLW

PSE

COG

CAF

GMB

SOM

HKG

BEL

MRT

BTN

CZE

ERI

SVN

LTU

CIV

PHL

MLT

GUM

ESP

TUN

GHA

BLR

SGP

JAM

BRB

GUF

MYS

TJK

VIR

NGA

MUS

LBY

ATG

TON

CRI

ZWE

TKM

MDV

NOR

ROM

DNK

BLZ

AGO

DMA

BOL

GLP

MWI

IRQ

WSM

KHM

IND

EGY

CMR

CHL

GTM

GEO

ARM

RUS

NAM

MAC

LVA

BGD

COD

FIN

KAZ

IRN

SYC

PAK

ALB

PAN

BRN

NIU

DZA

BDI

COL

PRK

ARE

AUS

PYF

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KNA

CPV

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VNM

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MHL

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ETH

This prep has a second part called 4b. Don't forget to do it!