

Exam week12

Fontys

11/26/2019

Before you start

Make sure that you have copied the StudentNoteBook to a folder on your computer, as well as the 2 database files. The 2 database files need to be in the same folder as the StudentNoteBook.

You can test the location by running the following code

```
getwd()
```

Make sure it returns your Exam_HandIn folder. If it does not return, save your StudentNoteBook in the Exam_HandIn folder. If you know that you are saving in the Exam_HandIn folder you can continue.

Now add your name:

Name:

Studentnumber:

Class: PC__

Introduction text

In this exam we will go over the theory you worked with earlier. In four sections we will focus on some of the questions and theory presented in the course of DDO. We will start with some questions regarding reading the ERD. Then there are 2 datasets in which we will run several queries, the first you might recognize as the Gapminder, the second is regarding different authors. Lastly we will combine the Queries that you have made with the Tidyverse skills we have obtained earlier in the course.

As we will be using different libraries you need to enable these:

```
library(tidyverse)
library(ggplot2)
library(DBI)
```

When finished

After completing all questions you can save the Notebook. Using the “knit” function to print your work into an HTML file completes the last task of the test. When you want to upload the work with EFIT make sure to close all applications, otherwise you cannot upload.

When everything is uploaded you can leave the room quietly.

Understanding a database

For this assignment we have the following ERD:

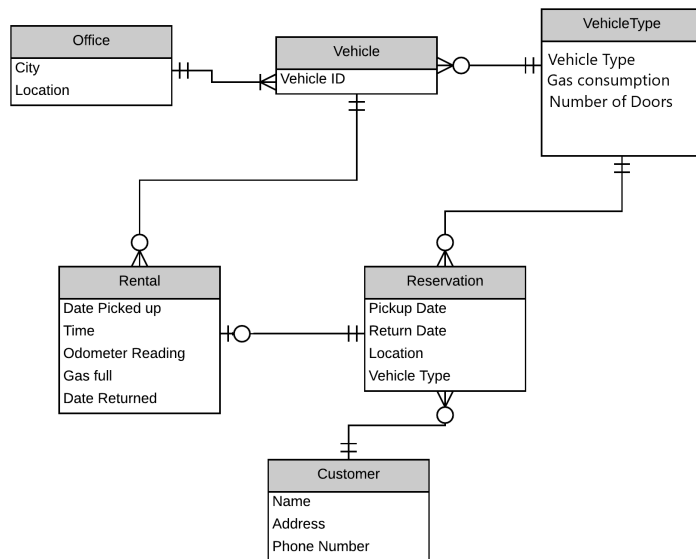


Figure 1: The rental ERD.

in this ERD there are 6 relationships. with respect to this ERD, would the following be true or false: (Delete what not applies)

1. A vehicle will always have a rental
TRUE/FALSE
2. A Rental will always have 1 Reservation
TRUE/FALSE
3. A vehicle is listed with one office only
TRUE/ FALSE
4. For every vehicle type there is at least 1 vehicle
TRUE/ FALSE
5. Every table will always need a primary key
TRUE/ FALSE
6. For a reservation it is optional to have a VehicleType
TRUE/FALSE

Describe the following relationships in plain English:

7. The relationship between Office and Vehicle
8. The relationship between Customer and Reservation
9. The relationship between Rental and Vehicle

gapminder queries.

In week 6 we have worked with Gapminder and the tidyverse. Now for the SQL we have the gapminder database available. To see the content of the table we can use the following code:

country	year	lifeExp	pop	gdpPercap
Afghanistan	1952	28.801	8425333	779.4453
Afghanistan	1957	30.332	9240934	820.8530
Afghanistan	1962	31.997	10267083	853.1007
Afghanistan	1967	34.020	11537966	836.1971
Afghanistan	1972	36.088	13079460	739.9811
Afghanistan	1977	38.438	14880372	786.1134
Afghanistan	1982	39.854	12881816	978.0114
Afghanistan	1987	40.822	13867957	852.3959
Afghanistan	1992	41.674	16317921	649.3414
Afghanistan	1997	41.763	22227415	635.3414

Note:

showing only the first 10 entries of the gapminder table

10. Show the name of countries, year, and life expectation from the table gapminder.

country	year	lifeExp
Afghanistan	1952	28.801
Afghanistan	1957	30.332
Afghanistan	1962	31.997
Afghanistan	1967	34.020
Afghanistan	1972	36.088
Afghanistan	1977	38.438
Afghanistan	1982	39.854
Afghanistan	1987	40.822
Afghanistan	1992	41.674
Afghanistan	1997	41.763

Note:

showing only the first 10 entries of the countries table

11. List all the countries from the gapminder table. Make sure there are no duplicate lines.

country
Afghanistan
Albania
Algeria
Angola
Argentina
Australia
Austria
Bahrain
Bangladesh
Belgium
<i>Note:</i> showing only the first 10 entries

12. List the information of China in 1967 from the Gapminder table

country	year	lifeExp	pop	gdpPercap
China	1967	58.38112	754550000	612.7057

13. What is the total population in 2007 according to the gapminder table

population
6251013179

14. Calculate the average gdpPercap of each country

country	average_gdp
Afghanistan	802.6746
Albania	3255.3666
Algeria	4426.0260
Angola	3607.1005
Argentina	8955.5538
Australia	19980.5956
Austria	20411.9163
Bahrain	18077.6639
Bangladesh	817.5588
Belgium	19900.7581
<i>Note:</i> showing only the first 10 entries	

15. Show the total population, average population, the minimum, and maximum population for Canada

total	Average	minimum	maximum
293555608	24462967	14785584	33390141

-
16. From the database we also have the table countries, give the country and continent code:

country	continent
Afghanistan	Asia
Albania	Europe
Algeria	Africa
Angola	Africa
Argentina	Americas
Australia	Oceania
Austria	Europe
Bahrain	Asia
Bangladesh	Asia
Belgium	Europe

Note:

showing only the first 10 entries

17. how many countries are there per continent?

continent	# of countries
Oceania	2
Americas	25
Europe	30
Asia	33
Africa	52

18. What is the population per continent?

continent	population
Oceania	212992136
Americas	7351438499
Europe	6181115304
Asia	30507333901
Africa	6187585961

Books queries

For a second set of queries we have a database with the following database model:

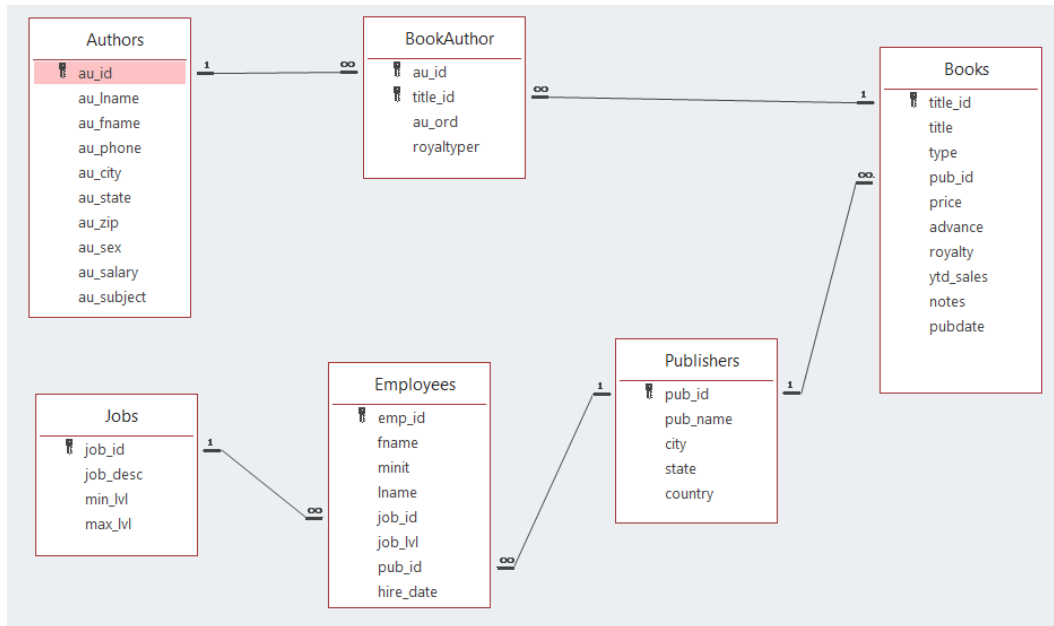


Figure 2: The books ERD.

19. Show a list of all authors whose first name starts with the 'An' characters.

au_id	au_lname	au_fname	au_phone	au_city	au_state	au_zip	au_sex	au_salary	au_subject
427-17-2319	Dull	Ann	415 836-7128	Palo Alto	CA	94301	F	14000	Travel
427-17-6319	Dull4	Ann3	415 536-7128	Rockville	MD	94301	F	15000	Sci-fi
427-67-2319	Dull3	Ann2	415 636-7128	Palo Alto	CA	94301	F	16000	Travel
627-17-2319	Dull1	Ann1	415 736-7128	Palo Alto	CA	94301	F	30000	Sci-fi
899-46-2035	Ringer	Anne1	801 726-0752	Salt Lake City	UT	84152	M	3000	Sci-fi
899-46-3035	Ringer1	Anne3	801 526-0752	Lawrence	KS	84152	M	4000	Sci-fi
899-46-8035	Ringer4	Anne3	801 56-0752	Salt Lake City	UT	84152	M	4000	Sci-fi
899-76-2035	Ringer3	Anne1	801 726-0752	Salt Lake City	UT	84152	M	4000	Travel

20. Show a list of all authors where the last 4 numbers of the id start with a 3 follow with three numbers.

au_id	au_lname	au_fname	au_phone	au_city	au_state	au_zip	au_sex	au_salary	au_subject
172-32-3176	White4	Johnson3	408 796-7223	Menlo Park	CA	94025	F	8000	Sci-fi
238-95-3766	Carson4	Cheryl3	415 848-7723	Berkeley	CA	94705	M	13000	Action
372-71-3249	Yokomoto1	Akiko1	415 835-4228	Walnut Creek	CA	94595	M	9000	Romance
527-72-3246	Greene	Morningstar	615 297-2723	Nashville	TN	37215	M	25000	Romance
527-82-3246	Greene3	Morningstar2	615 497-2723	Nashville	TN	37215	U	27000	Romance
672-31-3249	Yokomoto3	Akiko2	415 735-4228	Walnut Creek	CA	94595	M	4000	Sci-fi
672-71-3249	Yokomoto	Akiko	415 935-4228	San Jose	CA	94595	M	6000	Sci-fi
724-80-3391	MacFeather4	Stearns3	415 654-7128	Oakland	CA	94612	F	17000	Travel
798-72-3567	Ringer1	Albert2	801 626-0752	Salt Lake City	UT	84152	F	22000	Sci-fi
827-72-3246	Greene1	Morningstar1	615 397-2723	Nashville	TN	37215	M	26000	Romance

Note:

showing only the first 10 entries

21. list for each zip code the maximum salary and corresponding author. Only Looking at zip codes where the maximum salary is below 10.000.

au_id	salary	au_zip
341-92-1782	8000	66044
372-71-3249	9000	94595

22. What is the total price for books sold from the 'Algodata Infosystems' publisher? Use a subquery.

total_Price
94.88

23. List all employees who are involved in publishing a book for the Binnet & Hardley publisher. (use a subquery).

fname	lname	emp_id
Anabela	Domingues	ARD36773F
Daniel	Tonini	DBT39435M
Elizabeth	Lincoln	ENL44273F
Helen	Bennett	H-B39728F
Lesley	Brown	L-B31947F
Martine	Rance	M-R38834F
Peter	Franken	PHF38899M
Paolo	Accorti	PMA42628M
Paul	Henriot	PXH22250M
Victoria	Ashworth	VPA30890F

24. What is the total number of business books that are written per gender of the author? List gender and the total number of books.

total	au_sex
4	F
2	M

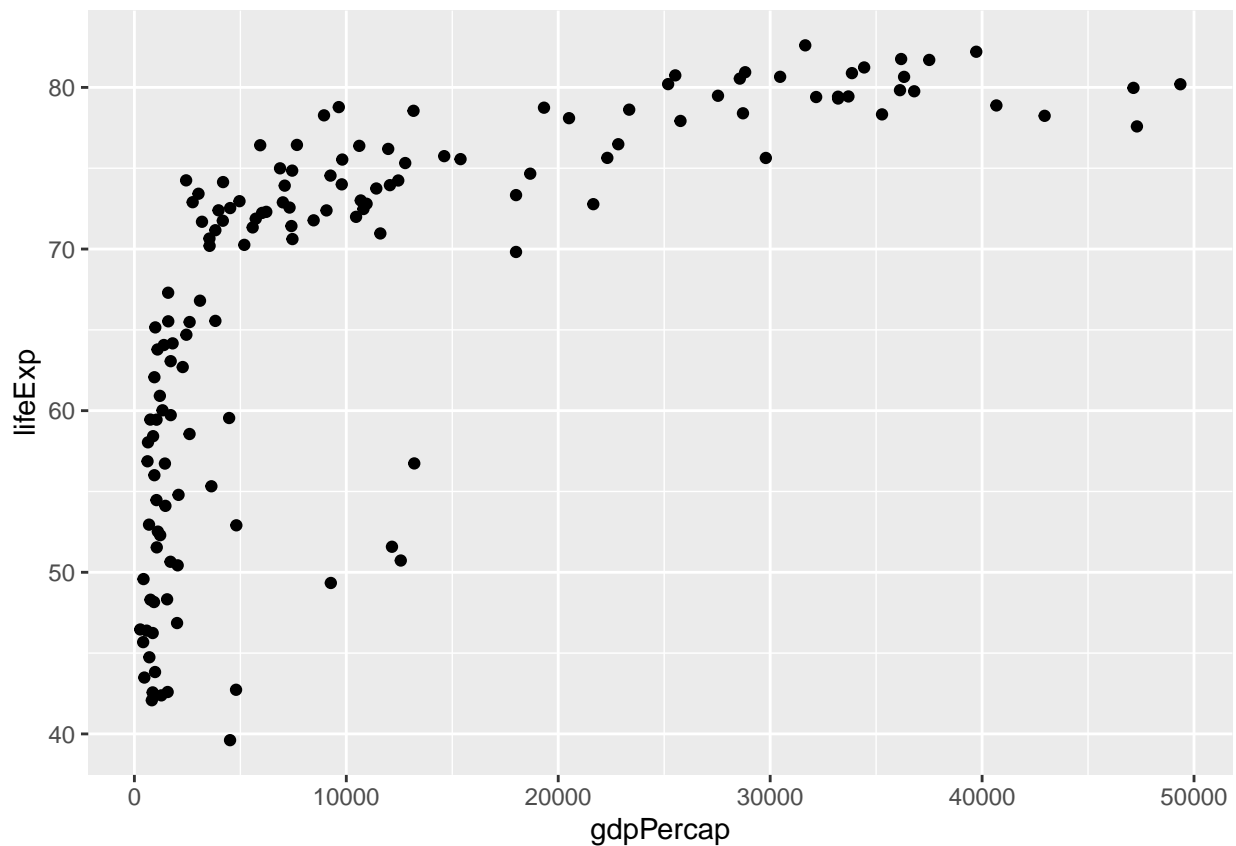
25. Who wrote the book with title 'Is Anger the Enemy?'? List the first and the last names of the author and the author id.

au_fname	au_lname	au_id
Anne1	Ringer	899-46-2035
Albert	Ringer	998-72-3567

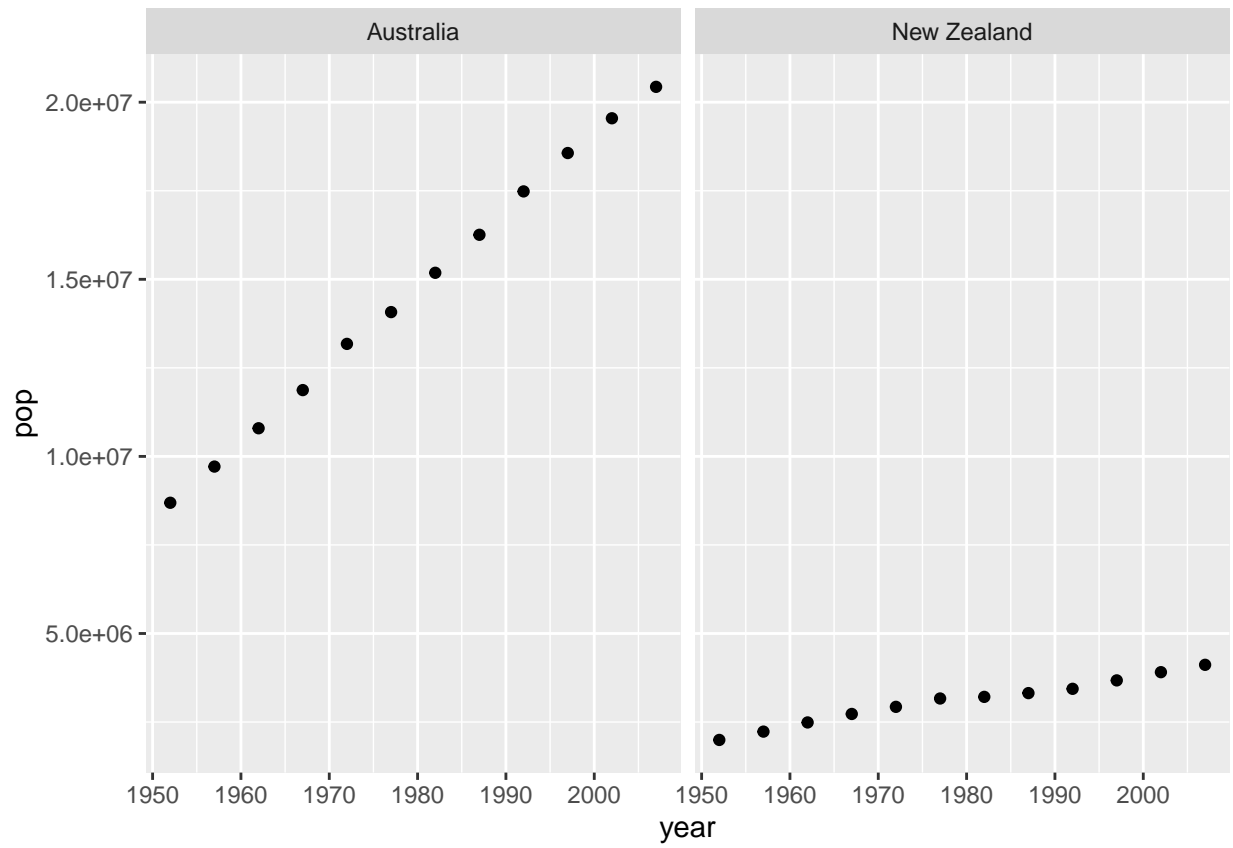
Bonus, Combining SQL and the tidyverse

After making the appropriate query you can use the tidyverse library to make the plots. Which code is used to get the below mentioned graphs?

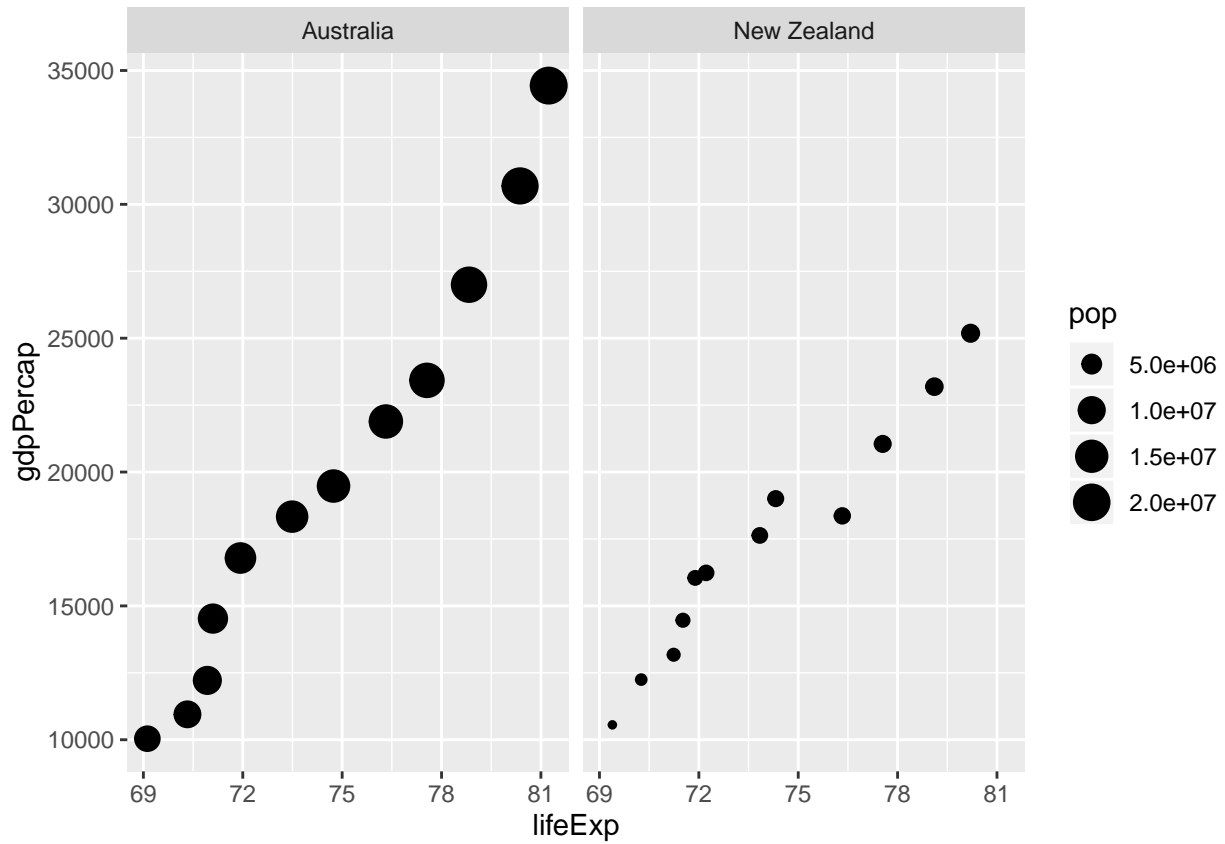
26. compare the gdpPercap against the lifeExp for 2007 only. (use the gapminder database.)



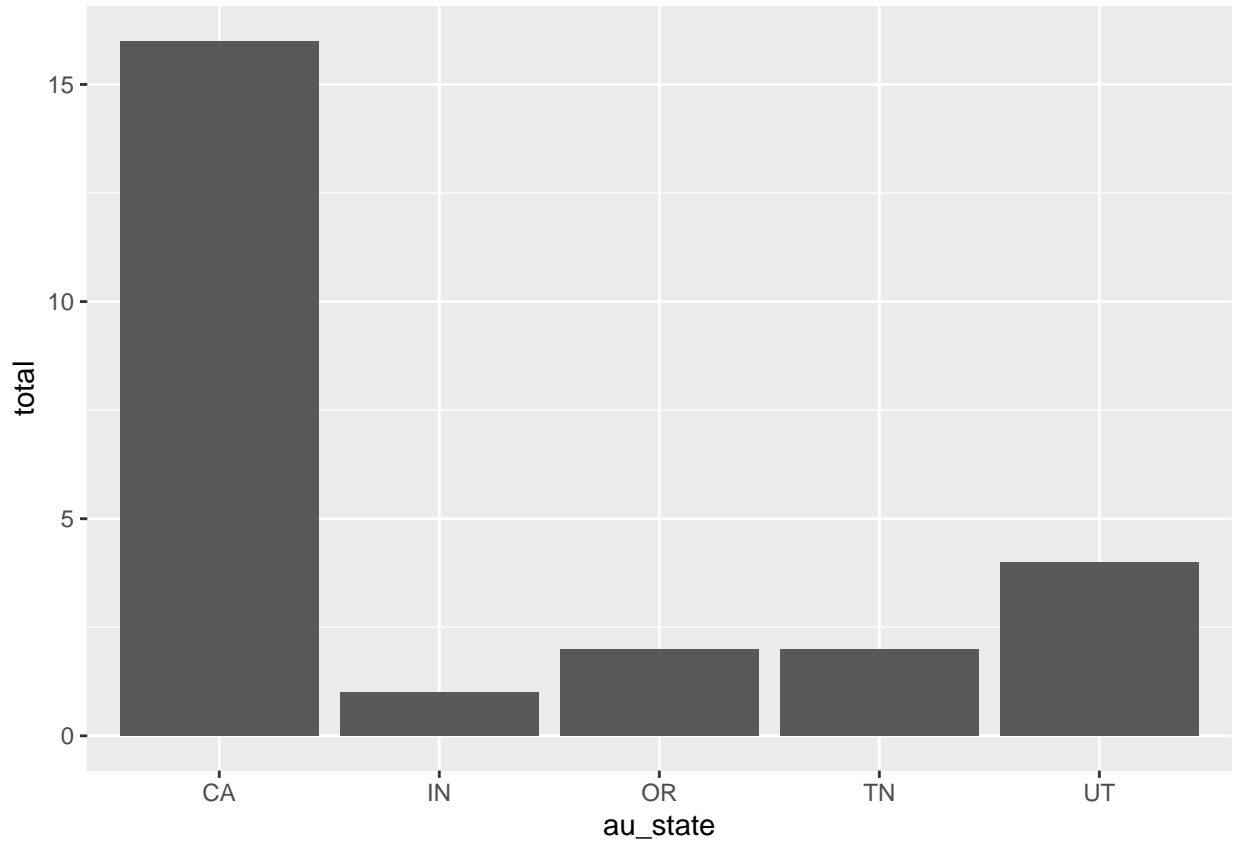
27. If we want to compare the countries in Oceania with each other on the growth in population over the years we could use the following graph. (use the gapminder database.)



28. One of the reasons in growth is the life expectancy. The life expectancy is in its turn related to the gdp. To get a view for both countries we can have a look at the following graphs. Plot the life expectancy against the gdpPerCap for both countries. use the population to indicate the growth. (use the gapminder database.)



29. In the Books database we want to see how many books are published per state of the Authors. (use the books database.)



End of test

Make sure to save everything in the right folder.

In the submission folder you include, your notebook, databases and HTML file.

Before you hit submit, make sure to close all other applications, including your browser and Rstudio!!

Then hit submit.