

# Quiz ADA and BRM

4<sup>th</sup> Trimester

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## Instructions

- You have 70 minutes to complete your quiz.
- This is an individual exam.
- You may not use the internet. You must have your Wi-Fi disconnected.
- All relevant R code and written answers must be answered in a .qmd file and then rendered to pdf. In case you cannot render to pdf, you may render it to html, but you will have a 5 points discount.
- Upload the full directory of your assignment to Moodle by the indicated deadline as a .zip file. The .zip file should include the .qmd, the .pdf/.html and the data.
- Your code must run on the grader's computer.
- The detection of any form of plagiarism in your work will result in a “fail” grade.
- You must separate all your questions and sub-questions using headers in the .qmd document.
- You can access all class materials but internet access is forbidden.

## Electric Vehicle Stocks

To answer this quiz, you must download the file `EV_stock.csv` from Moodle. The dataset contains information about the percentage of electric vehicles (EV) in the total number of vehicles, by country and year. The data is from *Our World in Data*. Each observation is a country in a given year. Table 1 contains the description of the variables. **Assume that you know nothing else about EV sales and draw no conclusions that cannot be drawn from this data alone.**

Table 1: Description of the Variables

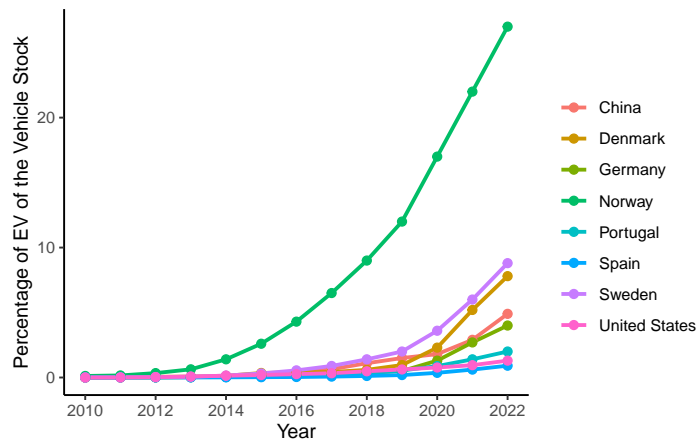
Variable	Description
region	Name of the country.
year	Year.
stock_share	Share of EV from 0 to 100.

## Questions

1. (20 points) Read the data into R and name the object `df`.
2. (30 points) Create a dataset called `df_china` containing all the observations for China.
3. (35 points) Print a dataset containing the average share of EV by year. We did it and it looks like this:

```
# A tibble: 13 x 2
  year av_stock
  <dbl> <dbl>
1 2010 0.0181
2 2011 0.0289
3 2012 0.0646
4 2013 0.116
5 2014 0.249
6 2015 0.480
7 2016 0.772
8 2017 1.16
9 2018 1.67
10 2019 2.29
11 2020 3.50
12 2021 5.22
13 2022 7.09
```

4. (35 points) How many countries are present in the sample? You must use R code to answer and cannot count them “by hand”.
5. (40 points) Build a plot showing the evolution per year of EV stock by country. Your plot must have points and lines divided by countries. We did it and it looks like this, but you don’t have to perfectly mimic our plot: (Hint: use `geom_line()`.)



6. (40 points) Estimate two linear models using `stock_share` as the dependent variable and `year` as the explanatory variable.
  - a. In the first model, integrate `year` as a trend; i.e., as a continuous/numeric variable.
  - b. In the second model, integrate `year` as several dummies; i.e., as a categorical/factor variable.