Day 05 - Exercise 01 - Inference and Predictions

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Preamble

The exercises here are taken from the `inferences-vs-predictions.R` file in the `scripts/day_05` directory.

In order to be able to run the code in here, you need to run the following:

```
## Installing packages
install.packages('caret')
install.packages('fGarch')
install.packages('boot')

## Loading packages
library('caret')
library('fGarch')
library('boot')
```

These packages are needed in order to run some of the commands.

We can now **load** the necessary libraries:

Model assumptions

Exercise 01

> Redo the simulations above. Instead of heteroscedastic errors, let the errors have a skewed normal distribution (use 'fGarch::rsnorm').

Exercise 02

> Redo the simulations above. Instead of heteroscedastic errors, let the errors have a normal distribution. But, assume that 'y' is also related to a second factor 'z' that is negatively correlated with 'x', and that 'z' is unmeasured (can't be used for inference/prediction). 'z' is an unmeasured confounder.

Bootstrap

Exercise 03

> Rerun the simulations above under the unmeasured confounding scenario (question 2 in the modeling assumptions lab). Does the bootstrap interval have better coverage than the Wald interval?

Sample bias

Exercise 04

> Redo the simulation above. Does the bootstrap interval have better actual coverage than the Wald interval under sample bias?