HW8

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Problem 1

Part A

We should expect a creatinine clearance rate of about 114 mL/minute for a 55 year old. This was obtained by finding the mean creatinine clearance rate of subjects 55 years of age in the dataset.

Part B

For every one-year increase in age, creatinine clearance should fall by -0.6198 mL/minute. I obtained this by fitting a linear model on the data, with "creatclear" as the outcome variable and "age" as the predictor, and taking the slope of the model.

Part C

The 40-year old has a healthier creatinine clearance rate than the 60-year old. This was obtained by finding the residual for each case, which was the individual's actual creatinine clearance rate subtracted by their predicted creatinine clearance rate. The 40-year old had a residual of 12.792 mL/minute and the 60-year old had a residual of 2.188 mL/minute, indicating that the 40-year old has a higher creatinine clearance rate for his age than the 60-year old does.

Problem 2

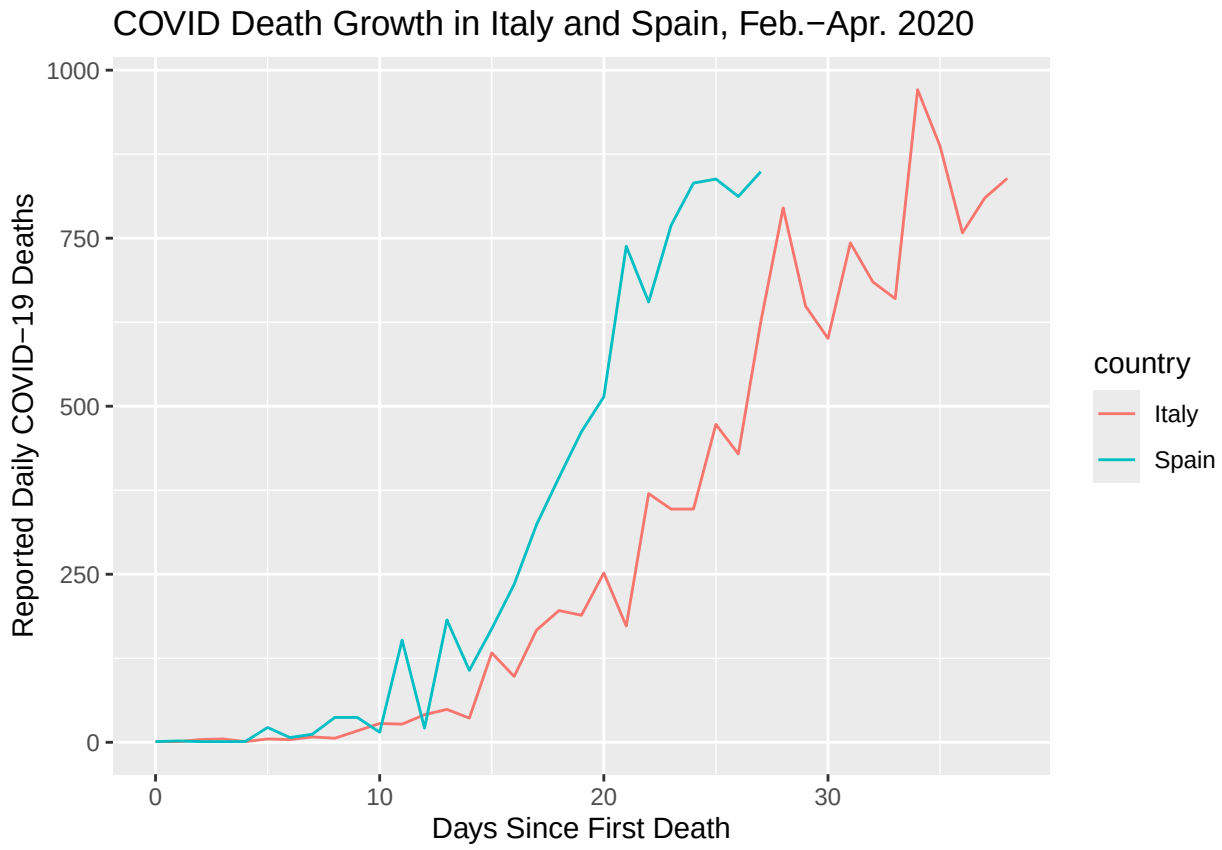
1.

It can be stated with 95% confidence that the true daily growth rate of COVID deaths in Italy lies between 0.159 and 0.208. It can also be stated with 95% confidence that the true doubling time of COVID deaths in Italy lies between 4.4 and 3.4 days.

2.

It can be stated with 95% confidence that the true daily growth rate of COVID deaths in Spain lies between 0.235 and 0.317. It can also be stated with 95% confidence that the true doubling time of COVID deaths in Italy lies between 3.0 and 2.2 days.

3.



Problem 3

Since the data follows a power law, I fit a linear model on the data and regressed the logarithm of milk sales (outcome) on the logarithm of milk prices (predictor). I repeated this 10000 times using 10000 bootstrapped samples and generated a 95% confidence interval. From there, it can be stated with 95% confidence that the true elasticity, or percent change of milk sales when milk prices increase by 1%, lies between -1.773% and -1.458%.