

# Homework 3

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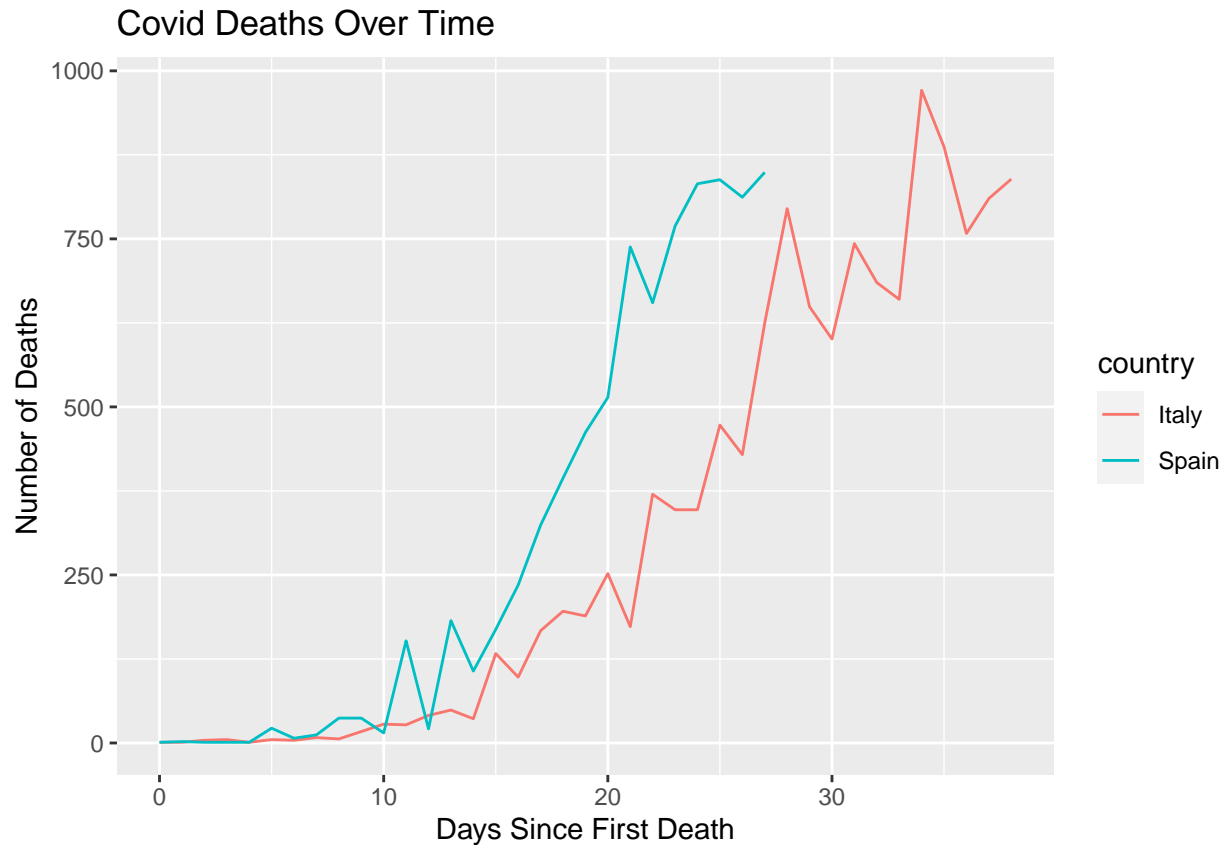
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Github: <https://github.com/aprasad-1/Homework3.git>

1. We should expect a clearance rate of 113.7230439 mL/minute for a 55 year old. To estimate the expected creatinine clearance rate of a 55 year old, I created a linear model between creatinine clearance rate and age. The equation I got was  $\text{creatinine\_clear} = \text{age} * -0.6198159 + 147.8129158$ . As age increases, creatinine clearance rates decrease according to the slope, -0.6198159 ml/minute per year, because it is negative. Since the residual of the creatinine clearance rate of a 40 year old, 11.9797183 is greater than that of a 60 year old, 1.3760353, it can be concluded that the 40 year old has a healthier clearance rate.
2. The beta of a stock measures the percent change of a stock with change in the market. In other words, beta measures the systematic risk of firm in a market. The average beta is 1.0, meaning that firms with a beta less than this number have less systematic risk than the average firm and those with higher than 1.0 have a higher systematic risk than the average firm. A firm can also have a beta of 0, which means the firm does not react to the market change and there is no systematic risk. Additionally, a firm can have a negative beta, meaning that it has a return rate less than the risk-free rate. These firms are usually invested in when the market is suspected to do really bad, which will give investors massive returns with the negative beta.

Ticker_Symbol	Intercept	Slope	R_Square
AAPL	0.009	1.066	0.013
GOOG	0.000	0.997	0.648
MRK	0.000	0.714	0.484
JNJ	0.000	0.677	0.502
WMT	0.001	0.519	0.285
TGT	0.002	0.708	0.248

The table above shows information about the linear model to predict the returns for each stock using the S&P 500. The slope represents the beta of the stock and R\_Squared quantifies the variation in the linear model. Walmart has the lowest beta of 0.516, meaning it has the lowest systematic risk. On the other hand, Apple has the highest systematic risk because it has the highest beta of 1.066.



3. The growth rate for deaths due to covid in Italy is 0.183 and the doubling time is 4 days. Additionally, the growth rate for deaths due to covid in Spain is 0.276 and the doubling time is 3 days.

The price elasticity of demand is -1.6185778. To get this value, I first had to linearize the data by applying the log function to both the sales and the price variables. Once the data was transformed from a power model to a linear model, I was able to find the slope of the model, which is the same as the price elasticity of demand.