Lab 11 - Math 58 / 58b: two quantitative variables

done during lab April 15 or 17, 2020

not due

Lab Goals

- visualizing two quantitative variables
- calculating correlation and least squares linear models

Getting Started

Load packages & data

Data set contains information from the Ames Assessor's Office used in computing assessed values for individual residential properties sold in Ames, IA from 2006 to 2010. See http://jse.amstat.org/v19n3/decock/DataDocumentation.txt for detailed variable descriptions.

```
library(tidyverse)

ames <- read_table2("http://jse.amstat.org/v19n3/decock/AmesHousing.txt")

amesurl <- "https://github.com/beanumber/oilabs/blob/master/data/ames.rda?raw=True"
load(url(amesurl))
```

Structure of the lab

Graphing two quantitative variables

The first part of the lab will be focused on exploring the data and learning about any nuances that might be relevant for our analysis.

> Recall, there is a data wrangling cheat sheet at: https://github.com/rstudio/cheatsheets/raw/master/data-transformation.pdf

> Recall, there is a `ggplot2` cheat sheet at: https://github.com/rstudio/cheatsheets/raw/master/data-visualization-2.1.pdf

Calculating correlation and linear model equation

Analysis

Graphing variables

1. Create a scatterplot with the explanatory variable (you choose!) on the x-axis, and the response variable on the y-axis. Be sure to have your axes labeled.

2.Superimpose the regression line onto your scatterplot. What happens when you make se=TRUE? What happens if you add color to the aesthetics (add color using a categorical variable)? Describe the plot.

Calculating correlation and linear model equation

3. Calculate and interpret correlation coefficient (sign, strength, linearity).

4. Determine and **interpret** the slope of the least squares line in context. The interpretation should be of the form: for every additional _____ we ESTIMATE that the AVERAGE _____ changes by _____.

5. Determine and **interpret** the intercept of the least squares regression line. Explain what this value might signify in this context. Is the interpretation meaningful within the context? Explain.