Today's Agenda

Weeks 14 and 15: The Final Project

- Assignment (w/ data) available on Moodle

Justin Leinaweaver (Spring 2022)

Final Report: The Data

Quarterly sales data for 16 salespeople at our hypothetical company

Sales Team: Amy, Beth, Bob, Chris, Dominic, Earl, Herman, Jessica, Lucy, Luke, Olivia, Ruth, Sarah, Seth, Suzanne, Tony

Time Period: Quarterly data from 2017 to 2021 (Winter, Spring, Summer and Fall)

Final Report: The Data

Salesperson	Year	Time	Quarter	Sales
Bob	2017	1	Winter	150.3
Bob	2017	2	Spring	129.41
Bob	2017	3	Summer	158.53
Bob	2017	4	Fall	196.4
Bob	2018	5	Winter	168.82
Bob	2018	6	Spring	169.37
Bob	2018	7	Summer	188.39

Each salesperson has 20 observations

(Sales across 4 quarters x 5 years)

Final Report: The Data

Salesperson	Gender	Region	Education	Age
Amy	Female	West	14	36
Beth	Female	North	12	47
Bob	Male	North	9	45
Chris	Male	South	12	40
Dominic	Male	East	18	49
Earl	Male	South	12	34
Herman	Male	West	18	60

Dataset provides basic demographic info for each salesperson

Final Report: The Data

Salesperson	Year	Gender	Region	Education	Age
Bob	2017	Male	North	9	45
Bob	2018	Male	North	9	46
Bob	2019	Male	North	9	47
Bob	2020	Male	North	9	48
Bob	2021	Male	North	9	49
Chris	2017	Male	South	12	40
Chris	2018	Male	South	12	41

Note that age increases across time!

Final Report: Three Sections

1. Each section requires a complete argument
   - Introduction, body and conclusion
   - Every claim requires statistical evidence
2. Assignment details on Moodle
3. Almost 6 hours of in-class time to work
   - Wk 14, 15 and the final exam period

Final Report: Section 1

1. How has our sales staff performed over the last year (2021)? Who are our strongest salespeople? Who are our weakest?

- Consider performance **both** in terms of **total sales** and in terms of **year-to-year growth**.
- Make an argument and support it with visualizations and descriptive statistics.

Final Report: Section 2

What is the profile of our most successful salespeople? Build a multiple OLS regression in order to identify the strongest predictors that explain quarterly sales.

- Consider each of the following predictors for your "best" model: Age, education, gender, region of the country, time and the quarter of the year.
- Be sure to include a properly formatted regression table, evaluate your model with all five textbook steps (including a residual plot) and make a marginal effects plot to visualize the strongest predictor of sales.

Final Report: Section 3

3. What is your best forecast of our company-wide sales for the next quarter (Winter 2022)? How confident are you in this projection?

- You will need to combine the quarterly sales figures for all of our salespeople to calculate a quarterly total for the business as a whole.
- You must consider the following methods: 1. naive, 2. MA-3, and 3. a linear prediction model (e.g. quadratic, cubic and season dummies)
- Be sure to provide your forecast results in both a table and a visualization.