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# **Lab 11**

PH142 Fall 2025

# Announcements

- **Lab 11:** due 11/21 at 11:59pm
- **Quiz 9:** due 11/21 at 11:59pm

## Coming Up...

- **Data Project Part 3:** due 12/5 at 5pm

\*You must check in with your assigned GSI before submitting part 3



# Week 13 Lecture Review

## Inference for Regression

### Assumptions:

1. **Linearity:** The relationship between  $x$  and  $y$  is linear in the population
2. **Normality of Residuals:** Variable  $y$  varies Normally around the line of best fit
3. **Independence:** Observations are independent
4. **Constant Variance:** The standard deviation of the responses is the same for all values of  $x$

# Week 13 Lecture Review

## Evaluating Assumptions

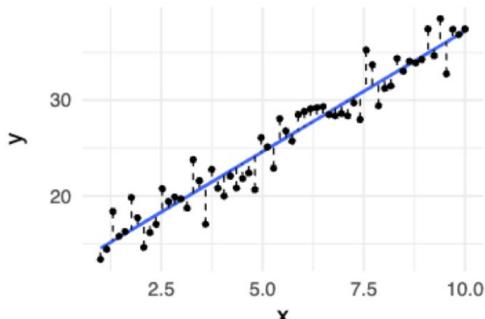
We can use different diagnostic plots to test our assumptions:

	<b>What to Look For</b>
Scatter plot of data w/ regression line	No trend, residuals are sometimes positive and sometimes negative
Q-Q plot of residuals	Residuals closely follow the line
Scatter plot of fitted vs. residuals	No trend, random scatter
Box plot of y vs. residuals	IQR of residuals box smaller than y box

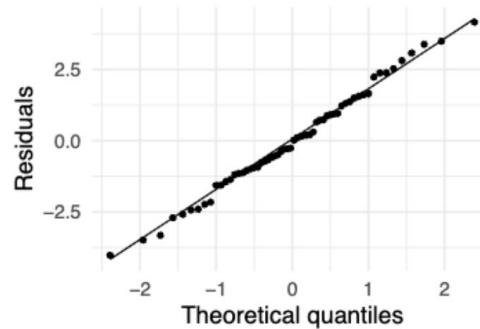
# Week 13 Lecture Review

**Good Example**  
(Assumptions met)

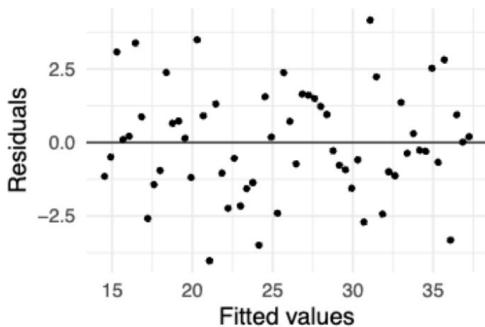
(a) Scatter plot



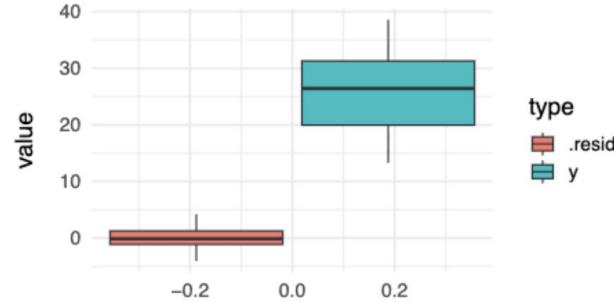
(b) Q-Q plot



(c) Fitted vs. residuals

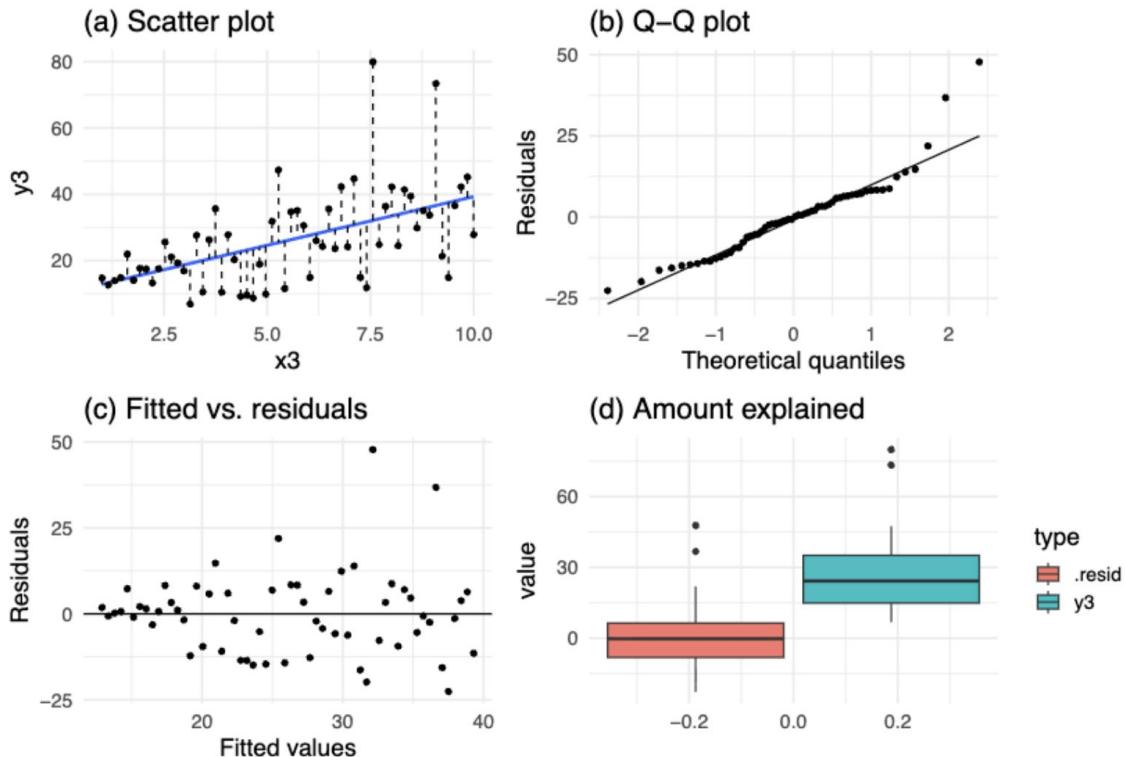


(d) Amount explained



# Week 13 Lecture Review

**Bad Example**  
(Assumptions not met)





# LAB 11 Walkthrough

# Lab Submission

- Follow the directions on the LAB11 file
- Submit using the **Terminal Tab** (next to the console in the bottom left pane)
  - Copy and paste the given line into the terminal
  - Follow prompts (NOTE: the terminal will **not** show your password being typed out!)
- **CHECK IN GRADESCOPE THAT ALL YOUR TESTS PASSED**