Lesson 12.1: Day 2: Does seat location matter – Part 2?

Do students who sit in the front rows do better than students who sit farther away? Mrs. Gallas took a random sample of 30 students from her classes and found these results.

Row	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3
Score	76	77	94	99	88	90	83	85	74	79	77	79	90	88	68	78	83	79

Row	4	4	4	4	4	4	5	5	5	5	5	5
Score	94	72	101	70	63	76	76	65	67	96	79	96

Line of best fit:__________________

Slope: b = _______ $S_b = 1.33$

1. If Mrs. Gallas were to take another random sample of 30 students, do you think the slope of the LSRL would be the same? Why?

2. **We are going to construct a 95% confidence interval for the slope of the population regression line. Identify the parameter and statistic.**

Parameter:__________________________________ Statistic:_____________

3. **There are five conditions to check.**

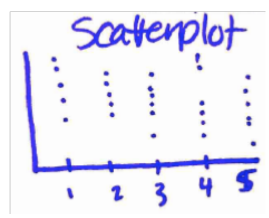
(1) **Linear:** The **scatterplot** needs to show a linear relationship AND the **residual plot** doesn't have a leftover curved pattern. Sketch each at right.

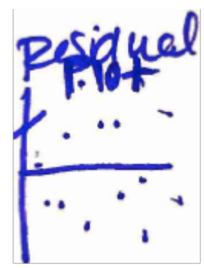
(2) **Independent:** Use 10% condition IF sampling without replacement

(3) **Normal:** A **dotplot of the residuals (or a histogram)** cannot show strong skew or outliers. Make one using the applet and sketch it at right.

(4) **Equal SD:** Look at Residual Plot - the variability in the residuals in the vertical direction should be ROUGHLY the same as you scan across most of the x-values. No sideways Christmas tree patterns, for example.

(5) **Random:** Either "SRS" or "Random Assignment"





Dot Plot of Residuals

4. **Construct the interval:**

General Formula: Specific Formula:

Work:

5. **Conclude:**

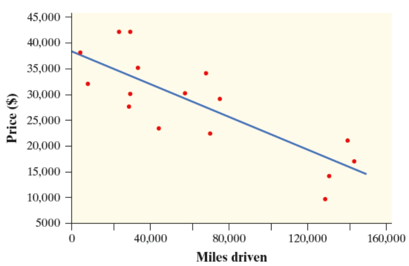
Conditions for Inference for Regression

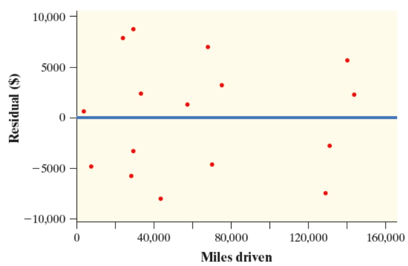
(For us, it means when doing inference for a slope)

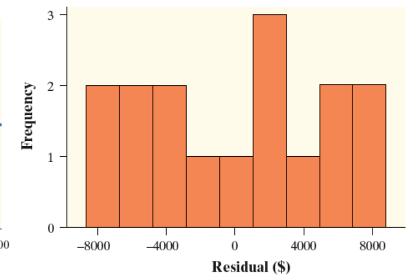
Confidence Intervals for Slope

Important ideas:

Mileage vs Value-Everyone knows that cars and trucks lose value the more they are driven. Can we predict the price of a used Ford F-150 Super Crew 4 x 4 if we know how many miles it has on the odometer? A random sample of 16 used Ford F-150 Super Crew 4 x 4s was selected from among those listed for sale on autotrader.com. The number of miles driven and price (in dollars) were recorded for each of the trucks. Here is some computer output from a least-squares regression analysis of these data. Construct and interpret a 90% confidence interval for the slope of the population regression line. *You can assume that the Conditions are met.*







Regression Analysis: Price ($) versus Miles driven

Predictor	Coef	SE Coef	T	P
Constant	38257	2446	15.64	0.000
Miles driven	−0.16292	0.03096	−5.26	0.000

S = 5740.13 R-Sq = 66.4% R-Sq(adj) = 64.0%

State

Do:

Conclude