Lesson 23: Computer Printouts

Daily Data Collection

Select two topics you think are correlated, make a hypothesis,

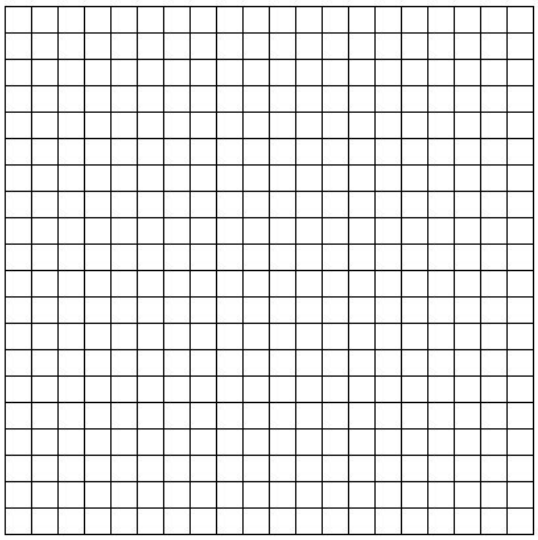
and run a test to see if your assumptions were true.

Class Data:

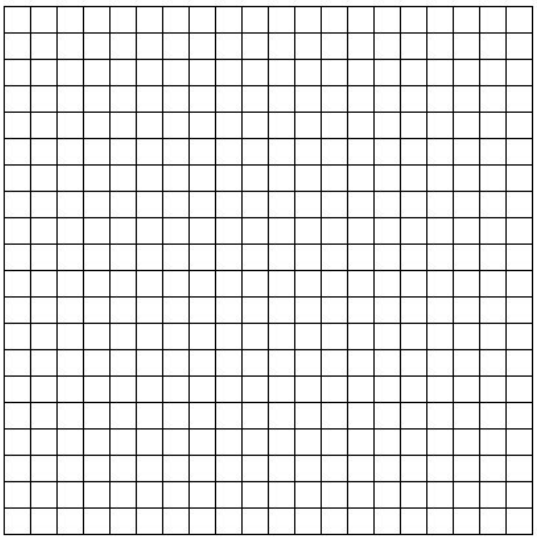
Explanatory Variable:

Response variable:

Create a scatterplot.



Create a residual plot.



Describe the Direction, Form, and Strength

Write an equation for the regression line

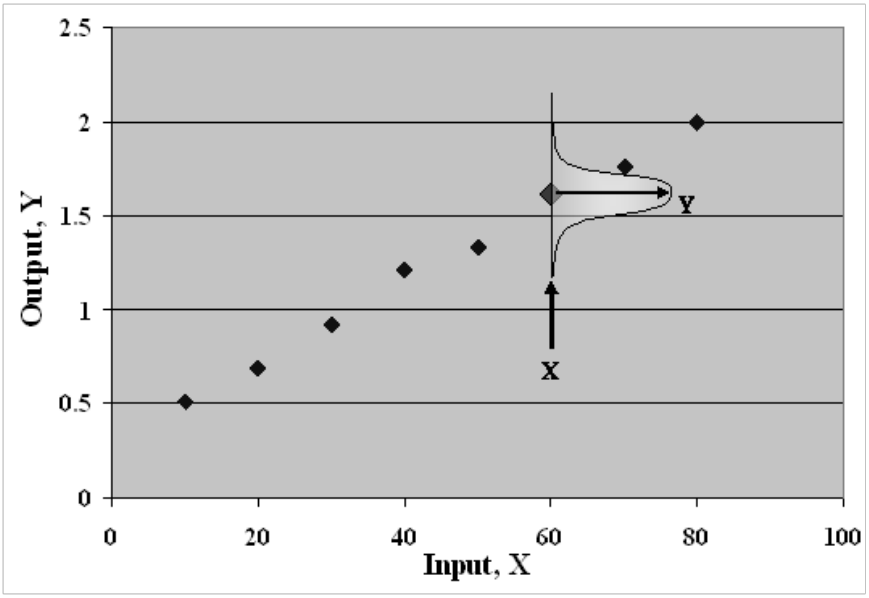
Describe the slope in the context of the situation

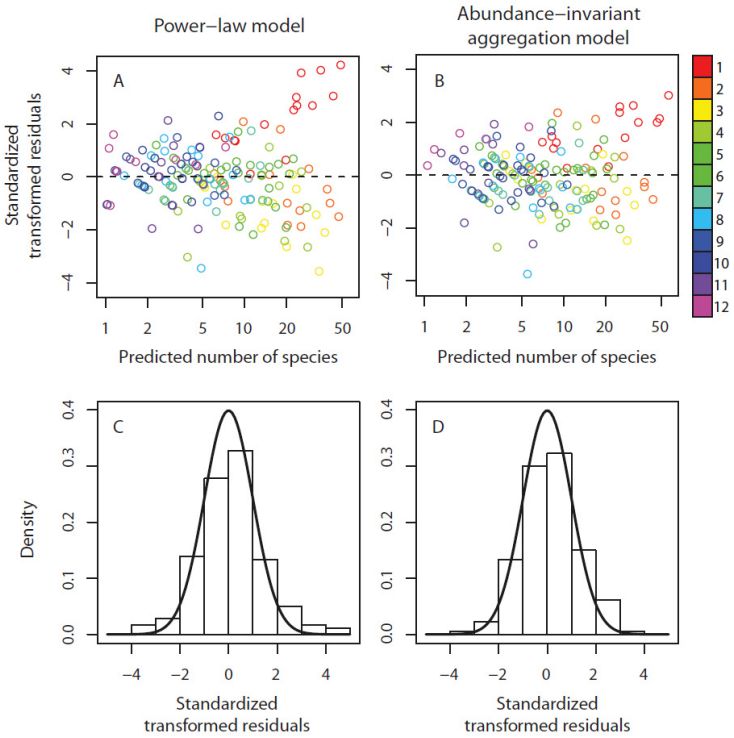
Find the residual value for your own data point

Describe the meaning of the r^2 value:

Now – Prepare to have your mind blown!!

- y hat is a prediction of the response variable based on the explanatory variable.
- The residual is the error, or distance, away from the predicted value.
- So for a given x value, we have a predicted y value. Most points will be close to this value, but some will be further away.
- What do we expect the distribution of these error distances to be?? NORMAL!!





Interpreting Minitab (computer) printouts

Does the weight of a bar of soap follow a linear pattern over time?

Here is a sample computer printout:

Predictor	Coef	SE Coef	T	P
Constant	123.141	1.382	89.09	0.000
Day	-5.5748	0.1068	-52.19	0.000

S = 2.94921 R-Sq = 99.5% R-Sq(adj) = 99.5%

The regression equation is Weight = 123 - 5.57 Day

Interpretations: t

The line intersects y axis at 123 with a slope of -5.57.

On the day = 0, weight is 123gm

For each increase in a day, the weight of the soap decreases on the average by 5.57 grams.

SE Coef: 1.382 is the standard deviation of the y-intercept and 0.1068 is the standard deviation of the slope.

T: ignore this column for now.

P: ignore this column for now.

S = 2.94921 is the standard deviation of the residuals and is called the Standard Error of the Estimate (SEE)

R-Sq = 99.5% is the coefficient of determination (r^2). Take the square root of this to find correlation – make sure the sign of correlation matches the sign of the slope.

R-Sq (adj): ignore this value.

The following is from the book:

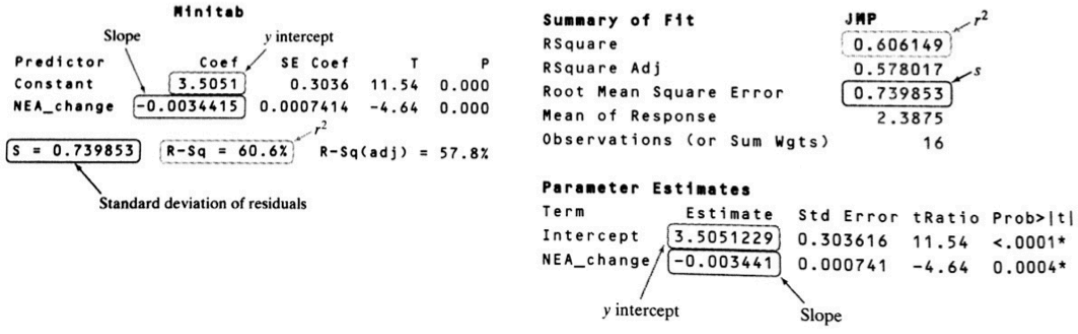


FIGURE 3.17 Least-squares regression results for the nonexercise activity data from two statistical software packages. Other software produces similar output.

The following example looks at Blood Alcohol Content (y) after x number of beers

Computer printout:

Predictor	Coef	SE Coef	T	P
Constant	-0.01270	0.01264	-1	.332
Beers	0.017964	0.002402	7.48	0

S = 0.0204410 R-Sq = 80.0% R-Sq(adj) = 78.6%

Regression Equation:

Strength:

SEE:

Standard deviation of the slope:

Predicted BAC after 5 Beers:

The legal limit in Ohio to be considered too intoxicated to drive is a BAC of 0.08. How many Beers will it take to reach this limit?

HW 23 Section 3-2: 63, 64, 65, 71-78 **study for Quiz 7 over lessons 19 to 23 and r15**