

Linear Regression & Computer Output: Interpreting Important Variables

II. More Practice with Linear Regression and Residual Plots

4. Fast food is often considered unhealthy because much fast food is high in fat and calories. The fat and calorie content for a sample of 5 fast-food burgers is provided below.

<u>Fat(g)</u>	<u>Calories</u>
31	580
35	590
39	640
39	680
43	660

- a) Identify the explanatory and the response variables:
- b) Use the calculator to make a scatter plot of these ordered pairs. Sketch the scatter plot here.
- c) What information does the scatter plot provide? That is, use the scatter plot to describe the relationship between the fat grams and calories in a fast food burger.
- d) Find the following summary statistics for this data:

$$\bar{x}, \bar{y}, s_x, s_y$$

- e) Now use your calculator to record the following statistics and to find the equation of the least squares line. Record the equation and use it for the remaining computations.

$$a, b, r^2, r, y$$

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- f) Examine a graph of the least squares line superimposed on your scatter plot.

Stat > calc > 8:linreg(a+bx) >L1, L2, Y

To get the Y to show up: Vars > Y Vars> 1:Function > 1: Y1

This will graph the LSRL along with your scatterplot. If you go to the Y= screen, you will now see the equation for the LSRL

- g) Does the line appear to be good model for the data?
- h) What is the value of your slope? What information does it provide? Be specific.
- i) How many calories would you predict a burger with 20 fat grams has?
- j) Calculate the residual for 35 fat grams.
- k) Calculate the value of r^2 . What information does it provide? Be specific.
- l) What is the value of r ? What does it tell you in this situation?
- m) Make a residual plot on your calculator. Be sure to label both axes with words and a “friendly” scale.
- n) Based on this residual plot, do you think the least squares line is a good model for this data