

## Discussion: Week 9

David Diez

**Review session ::** Next Thursday, 3:30-6:20pm. Young Hall 2200.

### Determining the LSR line ::

1. Find  $\bar{x}$ ,  $\bar{y}$ ,  $s_x$ ,  $s_y$ , and  $r$ .
2. Compute the slope  $b_1 = r \frac{s_y}{s_x}$ .
3. Because  $(\bar{x}, \bar{y})$  is on the line to find the equation of the line, the equation of the line is

$$y - \bar{y} = b_1(x - \bar{x})$$

Solve for  $y$  (and then label it  $\hat{y}$  since it is only the predicted value).

### Problems ::

- p160, #12. Determine if the correlation will be negative, positive, or about 0 in each plot. Is it exactly  $-1$  or  $+1$  in any of these cases?
  - (a) negative
  - (b) positive (not quite linear so wouldn't fit straight line to data)
  - (c) positive
  - (d) about zero.
- no.
- p189, # 36 (for (h), ignore burger part).
  - (a) yes.
  - (b) strong.
  - (c) Use  $\bar{x} = 20.6, \bar{y} = 472.7, s_x = 9.8, s_y = 144.2, r = 0.947$ . Use the steps above to find line:

$$\text{Predicted} = 185.7 + 13.93 \text{calories/fatgram}$$

- (d) Every extra fat gram adds 13.93 calories, on average.
- (e) A fat-free sandwich is predicted to have 185.7 calories (notice that we are extrapolating).
- (f) The sandwich has fewer calories than average (expected) for its grams of fat.
- (g) The chicken sandwich.
- (h) The calorie content of the fish sandwich has much less than expected for chicken sandwiches (547.9 calories).

- p213, #12 (parts 1 and 2 for abc&d).

- (a) 1) high leverage, which makes a large residual a bit smaller. 2) Yes, influential.
- (b) 1) high leverage, small residual. 2) yes, influential.
- (c) 1) low leverage, big residual. 2) not influential.
- (d) 1) high leverage, small residual. 2) not influential.

**Evaluations ::** To be filled out in the last 10-15 minutes of class.

**Chapter 13 material ::** For a review, look back to the first week's discussion notes.