

LSRL Review

Given this table find, by hand and/or with calculator:

x	50	30	20	25	40	20	35	60
y	8	9	12	10	11	12	10	8

x = seconds spent studying for test

y = number of mistakes made on test

Satterplot (comments) moderate/decreasing linear relationship

$$r = \frac{\sum \left(\frac{x-\bar{x}}{S_x} \right) \left(\frac{y-\bar{y}}{S_y} \right)}{n-1} \text{ (comments)}$$

$$r = -.804 \text{ neg. mod. strong -}$$

$b = b_1 = -.089$
 for each increase in sec. studied there is a .089 decrease in mistakes made.

$a = b_0 = 13.137$ (comment)

when $x=0$ $y = 13.137$
 do not study & make 13.137 mistakes

$\hat{y} = bx + a$ or $\hat{y} = b_1x + b_0$ $\hat{y} = -.089x + 13.137$

$\bar{x} = 35$

$S_x = 14.39$

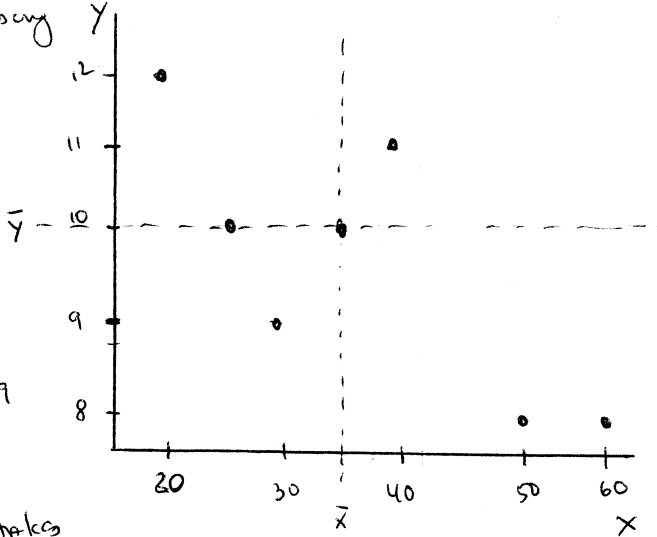
$b_1 = r \frac{S_y}{S_x}$

$\bar{y} = 10$

$S_y = 1.6035$

$b_0 = \bar{y} - b_1 \bar{x}$

mistakes = $-.089$ (secs studied) + 13.137

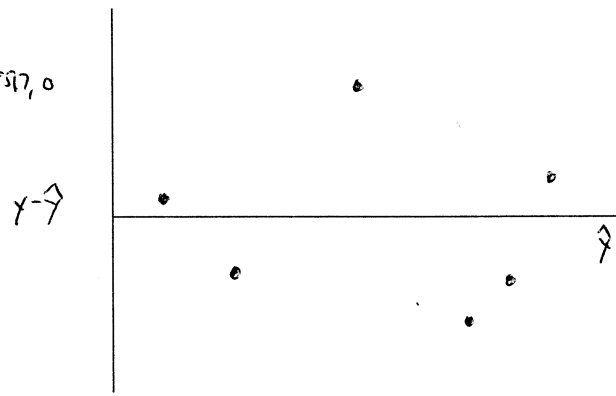


residuals = $y - \hat{y}$

- 0.6552, -1.448, .65517, -.8966, 1.4483, .65517, 0.243

residual plot (comment)

decently random given only 8 data points.



$R^2 = \frac{SSM - SSE}{SSM}$ (comment)

$= .647$

$SSE = \sum (y - \hat{y})^2 = 6.344$
 $SSM = \sum (y - \bar{y})^2 = 18$

$R^2 = \frac{18 - 6.344}{18}$

64.7% of the variation in # of mistakes can be explained by the LSRL of secs. studied & mistakes.

Homework
 Do above work
 Answers on website under "regression review"