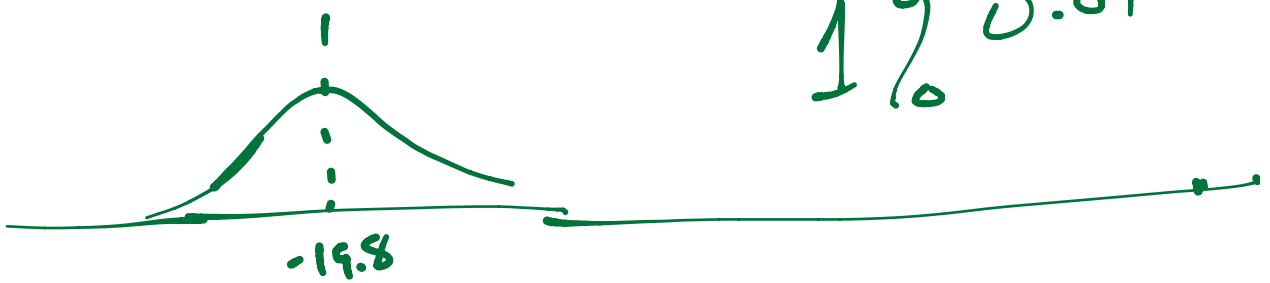


$$2.331 \rightarrow 233.1\%$$

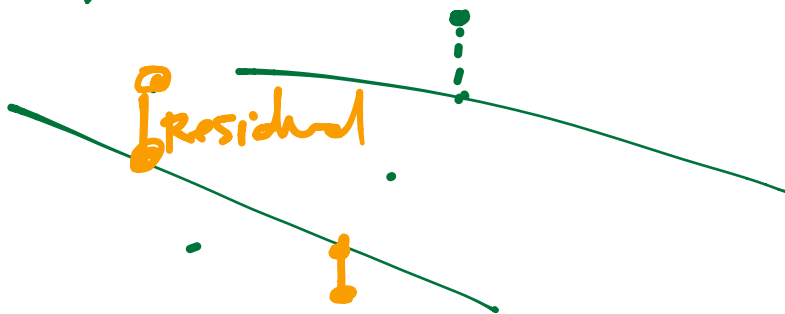
$$\bar{x} = -0.198 \rightarrow -19.8\%$$

$$1\% = 0.01$$



1% unit

$$\text{Residual} = \frac{\text{observed} - \text{pred.}}{\quad}$$



$S \rightarrow$  average error of residuals

$$S = \sqrt{\frac{\sum \text{residuals}^2}{n-2}}$$

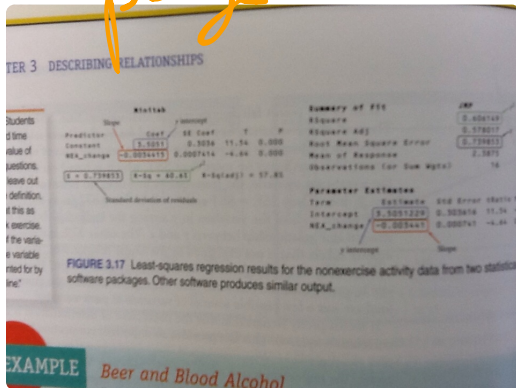
Honda problem

$$S = \sqrt{\frac{8499851}{11-2}} = \$972$$

Measured in units of response variable.

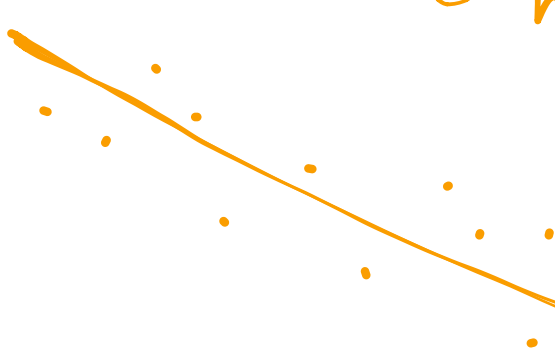
The average or typical error when using this model (mileage) to estimate price is \$972.

p. 182 - Software output top of page



To explain  $r^2$  :  
\_\_\_\_\_ % of the variation in  
response variable is accounted for by  
the regression line

Outlier - observation that falls outside of overall pattern →  $y$ -outlier can have a large residual



CHAPTER 3 DESCRIBING RELATIONSHIPS

influential observation - is an observation that markedly changes the result of LSPL.  $x$ -direction more affect

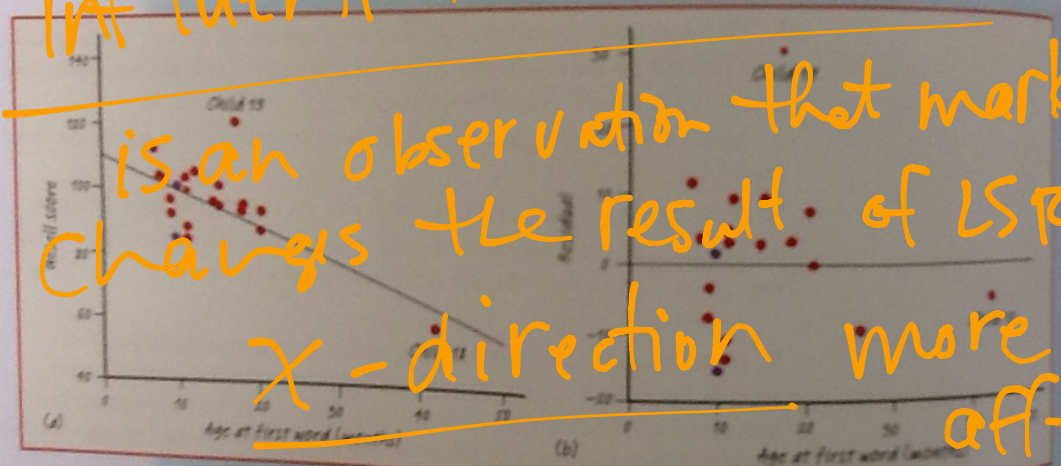
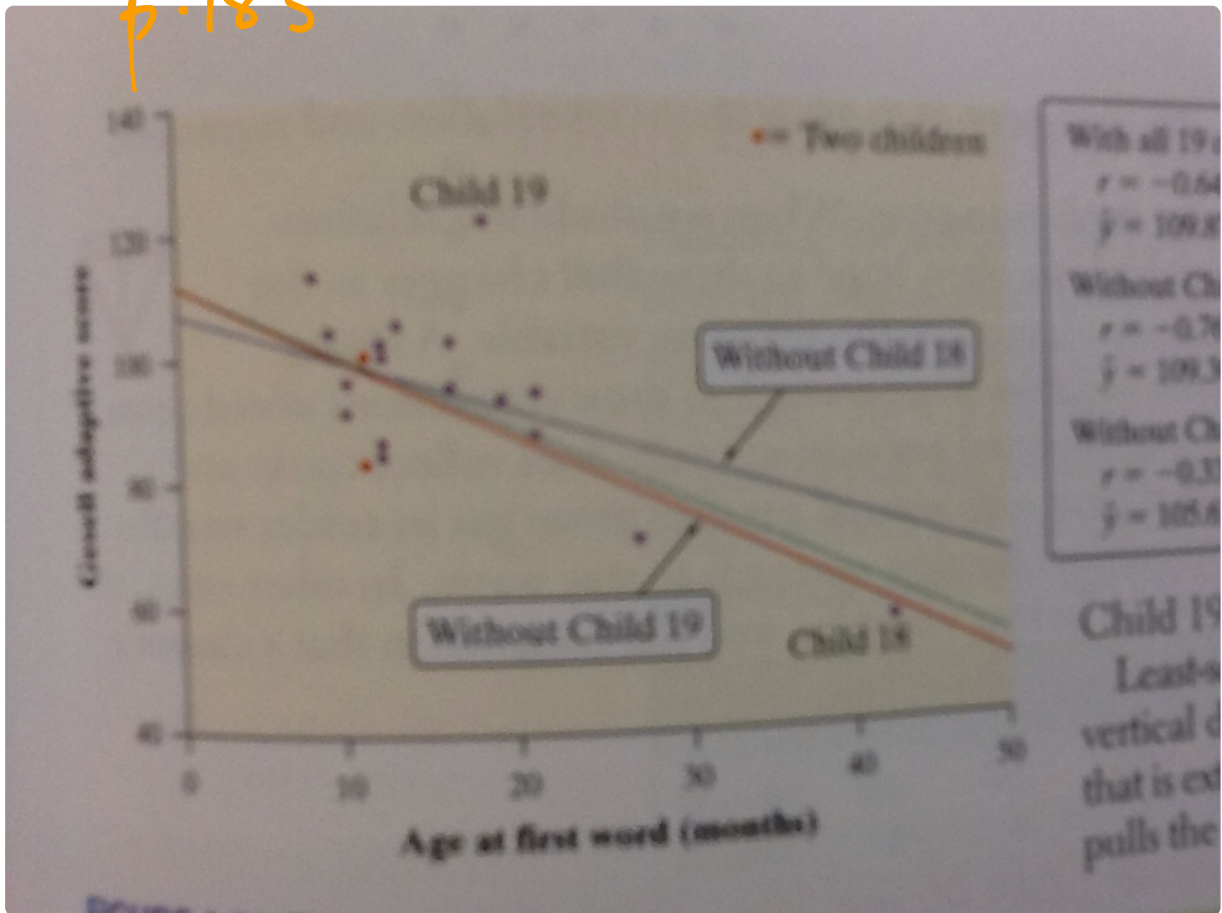


FIGURE 3.19 (a) Scatterplot of Gesell Adaptive Scores versus the age at first word for 21 children. The line is the least-squares regression line for predicting Gesell score from age at first word. (b) Residual plot for the regression. Child 18 and 19 are outliers.

correct.) Child 18 is an outlier in the  $x$  direction. This child began to speak much later than any of the other children. We used a calculator to find

p. 185



Is it possible to predict battery life using weight?

Weight

2.8

2.9

2.8

2.4

2.9

2.9

2.9

2.7

2.8

2.8

3.2

2.7

2.9

2.7

2.6

2.8

2.4

2.4

Battery Life

2.6  
2.5  
2.5  
2.5

Linear Regression 185

least-squares regression line to

regression line to

our data sets.

willing to use the

stant. You

usual point

st-squares line

g example sheds some

STEP 4

score on a test of mental

orded the age in months

a Gesell Adaptive Score,

appear in the table below.

Child	Age	Score
15	11	102
16	10	100
17	12	106
18	42	57
19	17	121

Battery life (hours)	Weight (pounds)	Cost (dollars)
6.00	2.8	370
7.75	2.9	350
7.25	2.8	330
5.50	2.4	370
8.25	2.9	360
9.50	2.9	400
7.75	2.9	340
7.75	2.7	340
8.00	2.8	350
7.00	2.8	350
6.50	3.2	360
6.25	2.7	310
5.25	2.9	330
5.00	2.7	320
3.75	2.6	380
4.50	2.8	335
2.75	2.4	350
2.75	2.4	300
2.50	2.6	280
2.50	2.5	500
2.00	2.5	290
2.75	2.5	500

Is it possible to predict battery life of a

Scatterplot

$x \rightarrow$  Weight

$y \rightarrow$  Batt. life

A hand-drawn coordinate system with two axes. The vertical axis is labeled "life (hrs)" and the horizontal axis is labeled "Wt. pounds". The axes are drawn as simple lines meeting at an origin.