Ams7

12 Nov

+20 "-

2.45 - 1.65

T

This time: LWP L-220

A correlation

next time:

hub 4 due next Mn (19 Nov) in class

fact +4 3 different shapes

ire not useful in predicting

toutliers can distort

especially with small
homework

\[ V = 0 \]

strong non-linear relationship
(quadric)

\[ \text{age} \times \]

\[ y \]

add a constant \((c > 0)\) to \(t\)
\((c < 0)\)

leaves \(r\)
unchanged

\[ x \]

add a constant \((c > 0)\)
\((c < 0)\)

leaves \(r\)
unchanged
Q: Is this very large in practical terms?

A: $x = 10 \rightarrow y = 7 \text{ cm}$

so $r$ is practical

$x = 11.5 \rightarrow y = 8.25 \text{ cm}$

This size is large in practical terms

$r = 1.87$ (wing, tail) span

A: All $x$ by 2
\[ \hat{y} = \hat{\beta}_0 + \hat{\beta}_1 x \]

**Regression Line Equation**

\[ \hat{\beta}_1 = \frac{\sum (y - \bar{y})(x - \bar{x})}{\sum (x - \bar{x})^2} \]

\[ \hat{\beta}_0 = \bar{y} - \hat{\beta}_1 \bar{x} \]

\[ y = x \]

- **tall** parents have **tall** sons, but not as **tall**
- \( h = 1000 \) families
  - a random son + \( h \)
  - father + \( h \)

w/ at least 1.56
another way to get the best line for pred. $y$
from $x$

$y = \beta_0 + \beta_1 x$

\[
\frac{1}{n} \sum_{i=1}^{n} \left( y_i - (\beta_0 + \beta_1 x_i) \right)^2
\]

Find $\beta_0$, $\beta_1$
to minimize

(result: least squares line

(Gauss)

1800

Fact: regression line II
least squares line