Week 14 Tuesday

April 9, 2019 8:08 AM

$\mu = 7.1 \quad \sigma = 5.2 \quad n = 50$

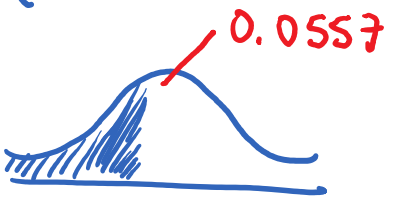
$P(\bar{x} < 7)$ $\quad (n \geq 30 \checkmark)$

$$z = \frac{\bar{x} - \mu}{\sigma/\sqrt{n}}$$

$$= \frac{7 - 7.1}{(5.2/\sqrt{50})}$$

$$\approx -0.14$$

$= P(z < -0.14)$

$=$ 

$= 0.5 - 0.0557$

$= 0.4443$

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10. Linear Regression Cnt'd

Omit Example 4

Ex 3. Given: $\hat{y} = 5.61 - 0.13x$ and the coefficient of determination is 0.9522.

x=age of Toyota Corolla (years)	y=resale value ($1000s)
2	5.4
3	5.1
5	4.9
7	4.8
10	4.2

a) Is the linear association positive or negative?
b) Find the correlation coefficient.
c) What % of the variation in y is accounted for by the best-fit line?
d) What resale value is predicted for a 4-year-old Corolla?
e) Why should we not predict the resale value for a 1-year-old Corolla?
f) What age corresponds to a resale value of $4,500?

d) What resale value is predicted for a 4-year-old Corolla?
e) Why should we not predict the resale value for a 1-year-old Corolla?
f) What age corresponds to a resale value of $4,500?
g) Interpret the slope of $\hat{y}$

a) Negative association

As $x \uparrow$, $y \downarrow$

b) Recap: r = Correlation coefficient

r^2 = Coefficient of determination

$r^2 = 0.9522$

$r = \pm\sqrt{0.9522}$

Use $\ominus$ from part a)

$r = -0.98$

c) $r^2 = 0.9522$

95.22% of variation in y is accounted for by $\hat{y}$

d) $x = 4 \rightarrow$ $y = 5.61 - 0.13x$

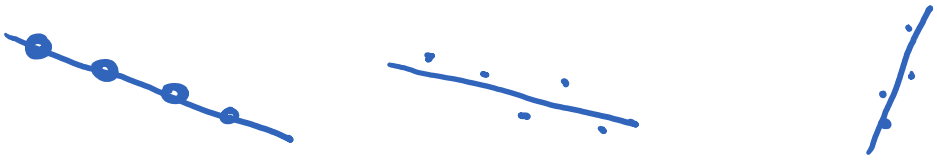
$y = 5.61 - 0.13(4)$

$y = 5.09$ UNITS

$y = \$5090$

RECAP

$r = -1$ $r = -0.8$ $r = 0.8$



e) Our data has $2 \leq x \leq 10$
Don't predict outside this range

f) $y = 4.5 \rightarrow y = 5.61 - 0.13x$

$4.5 = 5.61 - 0.13x$

$-1.11 = -0.13x$

$\frac{-1.11}{-0.13} = x$

$x \approx 8.5$ years

g) slope $= -0.13$

As x increases by 1, y decreases by 0.13

As the car ages 1 year,
resale value decreases by \$130
(on average)

Announcements

- Wed 17th 1:30pm CC124

- Assigned seating
- Exam Office Hours
  Tues 16th / Wed 17th 11:30–1:00
  CBA 151
- Review Questions and Solutions
  www.leahhoward.com
  Omit # 8, 16, 22, 27 b,c 29 b,c
- Exam Breakdown
  19 Questions
  80 Marks Total

Topic	% of marks
Calculus (Ch 28)	23
29.3/29.4	10
DE (Ch 31)	26
Stats	41

Review

Ex: Use partial fractions to evaluate $\int \frac{-6x+1}{x^2+5x+6}\,dx$

$x^2+5x+6 = (x+2)(x+3)$

$$\frac{-6x+1}{(x+2)(x+3)} = \frac{A}{x+2} + \frac{B}{x+3}$$

Mult. by $(x+2)(x+3)$:

$$\frac{-6x+1}{(x+2)(x+3)}(x+2)(x+3) = \frac{A}{x+2}(x+2)(x+3) + \frac{B}{x+3}(x+2)(x+3)$$

$$\boxed{-6x+1 = A(x+3) + B(x+2)}$$

$x=-3$: $\quad 19 = B(-1)$

$B = -19$