

STT 200 3pm 4-21-10

Note Title

4/21/2010

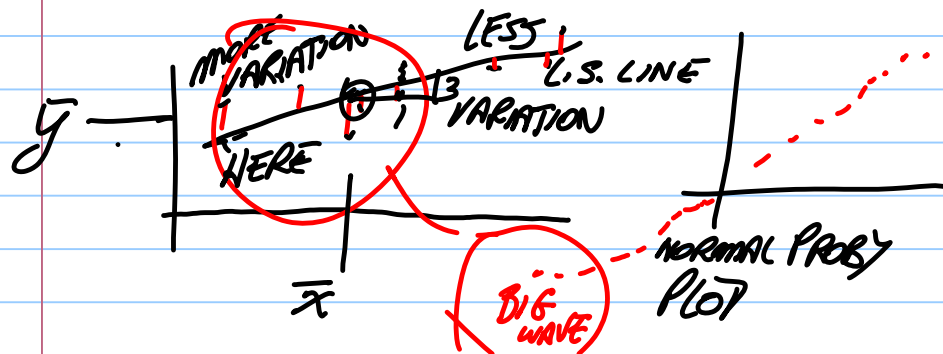
4-21-10 CRICKETS. $n=15$

$X = \#CHPS$ $Y = \text{Temp.}$

20 89

$\bar{x} = 14$ $\bar{y} = 76$

REGR STATISTICS: \bar{x} \bar{y} s_x s_y r b_1 (SCOPE)



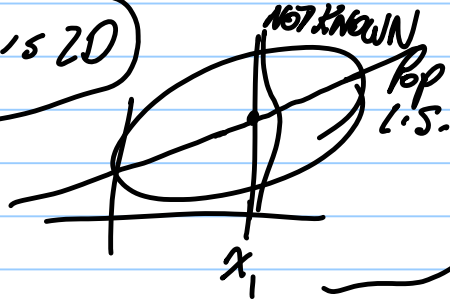
FOR THE ABOVE POINT OF AVG. (16.6, 80/33)

SLOPE (FROM SAMPLE L.S.) $b_1 = r \frac{s_y}{s_x} = 3.21$

IF THE DATA (x, y) IS OF FORM

$$y_i = \beta_0 + \beta_1 x_i + \epsilon_i \sim \text{INDEP } N(0, \sigma^2)$$

OPERATIVE IF (x, y) DIST IS 2D NORMAL.



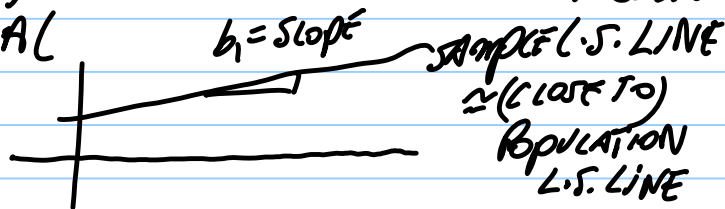
(A PART OF LIFE)

TEXT'S TALK ABOUT "STRAIGHT ENOUGH PLOT"
NORMAL PROB' PLOT BEING \sim LINE ETC.

ALL ABOUT WHETHER 2D NORMAL SEEMS
TO BE PRESENT.

NOT SEEN IN ABOVE - LET'S PROCEED

FORMALLY - SHOW WHAT TO DO HAD IT BEEN
NORMAL



IF POP 2D NORMAL (OR EVEN IF MODEL

$$y_i = \beta_0 + \beta_1 x_i + \varepsilon_i \sim N(0, \sigma^2)$$

- APPLIES) \Rightarrow CAN GIVE FOR EACH $n > 2$

CI FOR β_1 .

EST'D SD OF b_1

$$(TEXT) b_1 \pm t_{n-2, .95} SE(b_1)$$

$$SE(b_1) = \frac{\sigma_{\varepsilon}}{\sqrt{n-1} \sum x_i} = \frac{\sqrt{1-r^2}}{r \sqrt{n-2}} b_1$$

$$SE(b_1) = \frac{\sqrt{1-0.825^2}}{0.825 \cdot \sqrt{15-2}} \cdot 3.216 \dots = 0.610 \dots$$

DF 13 = 15 - 2

95% CI

FOR β_1

$$= 3.216 \pm 2.16 (0.610 \dots)$$

POP SLOPE = {1.898, 4.534}

! PROVIDED NORMAL MODEL APPLIES

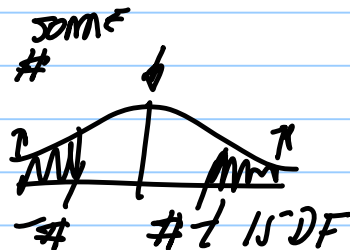
FOR TEST OF $H_0: \beta_1 = 0$

TEST STAT (UNDER H_0 TRUE) HAS $t_{DF=n-2}$ DISP.

TEST STAT IS $\frac{b_1 - \beta_1}{SE(b_1)} = \frac{\hat{\beta} - 0}{\frac{\sqrt{1-r^2}}{\sqrt{n-2}}} = \frac{2\sqrt{n-2}}{\sqrt{1-r^2}}$

SO WITH PRESENT DATA

TEST STAT $\frac{0.825 \cdot \sqrt{13}}{\sqrt{1-0.825^2}} = \#$



2-SIDED TEST

PRINTERS EXAMPLE PPM = pages/min
COST OF PRINTER.

REGR STATS $\bar{x}, \bar{y}, s_x, s_y, r, b_1$

$x \quad y \quad x^2 \quad y^2 \quad xy$

DATA

AVGS

COMMENT ON SUITABILITY OF NORMAL MODEL QUESTIONABLE

AND CALC b_1 (SEE SAME AS GIVEN IN REGR STATS)

THE $SE(b_1)$ + 95% CI FOR β_1 :

Pg 2. LITTLE LEAGUE BASEBALL. PITCHERS.
STRIKEOUTS IN 50 PITCHES.

x = BEFORE y = AFTER. (VIDEO)

x y
28 35

