

Discussion
Section:
week of
2-6 Dec 19

Reader pp. R- (14) (15)

STAT 7
2 Dec 19

$$°F = \left(\frac{9}{5}\right) (°C) + 32°$$

↑
(1.8)

①

this is like the
sparrows (wing length,
tail length) case study

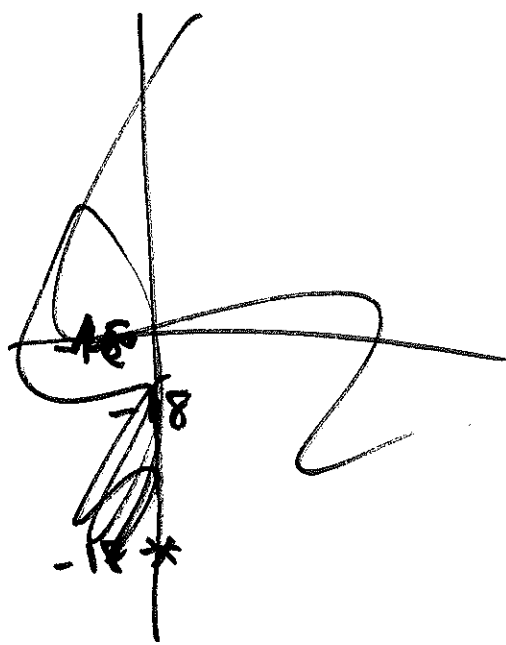
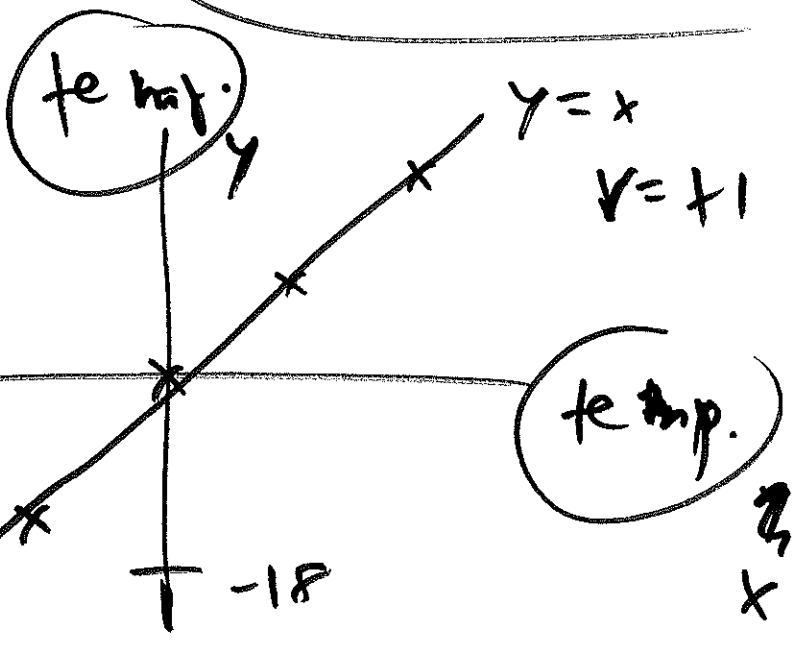
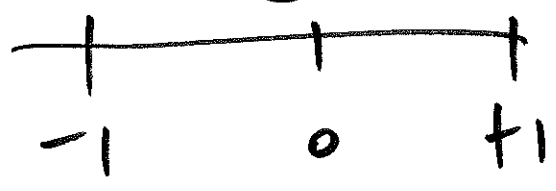
open	temp.
y_1	x_1
\vdots	\vdots
y_i	x_i
\vdots	\vdots
y_n	x_n

$n=8$

mean $\bar{y} =$ $\bar{x} =$

s.d. $s_y =$ $s_x =$

← (r) correlation →



$$r = \frac{1}{n} \sum_{i=1}^n \left(\frac{x_i - \bar{x}}{s_x} \right) \cdot \left(\frac{y_i - \bar{y}}{s_y} \right) \quad (2)$$

$$r(x, y) = r(y, x) \quad r = -.9904$$

(a) ✓ (b) r would be unchanged

L-229, L-228
model, inferential summary

estimate of ρ : $r = -.9904$

$$SE_{\text{FE}}(r) = \frac{1-r^2}{\sqrt{n-3}} = 0.0085$$

give or take

for r as est. of ρ

R-25 f. (16)

approx.

95% CI

for ρ

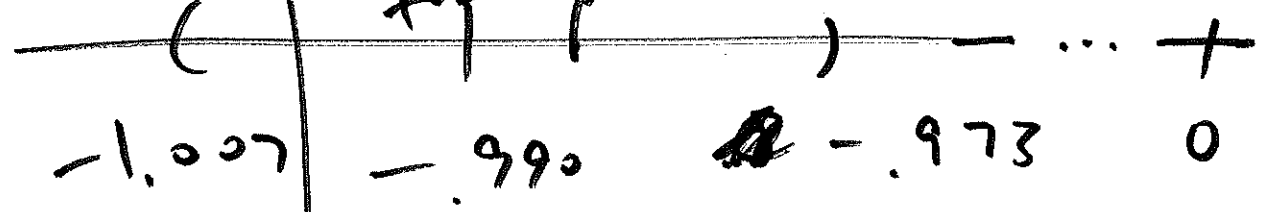
$$r \pm 2 \hat{SE}(r)$$

$$(-.9904) \pm 2(.0085)$$

-.990

.017

approx. 95% CI for ρ



truncate at -1

$$(-1.0, -.973)$$

(c)(i)

~~Q: is -.990 statistic!~~

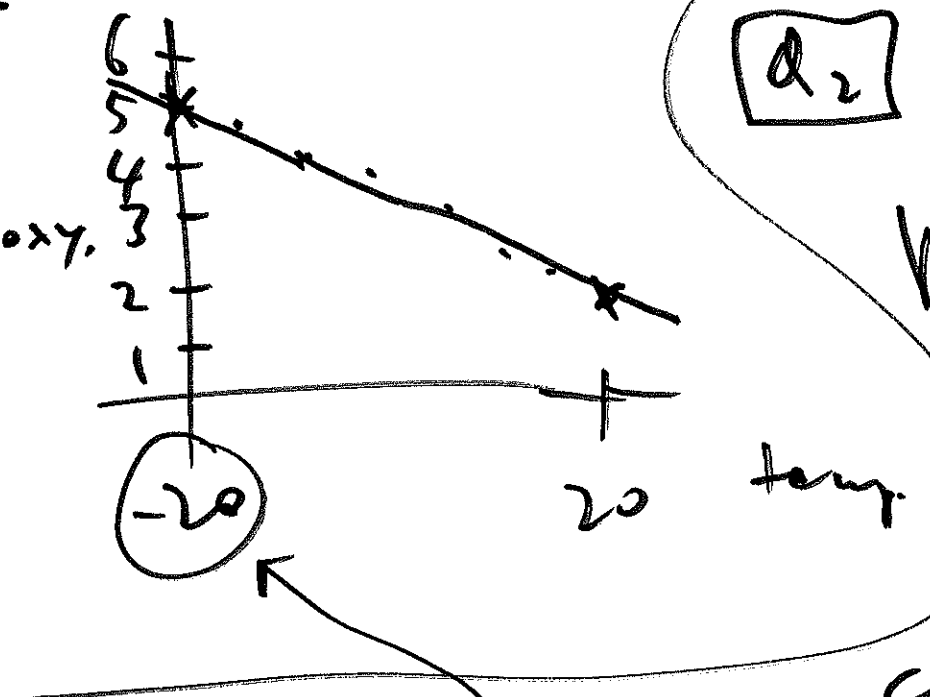
Q: is $r = -.990$ statistic different from 0?

A: yes 0 is nowhere near our 95% CI

nothing
null: $\rho = 0$

d_2 : $r = -0.9904$ (4)

pract. sig. diff
from 0,



A_2 Consider
corresponding

birds at -20°C : Y value = 5
(x)

($+18^\circ\text{C}$) Y — = 2

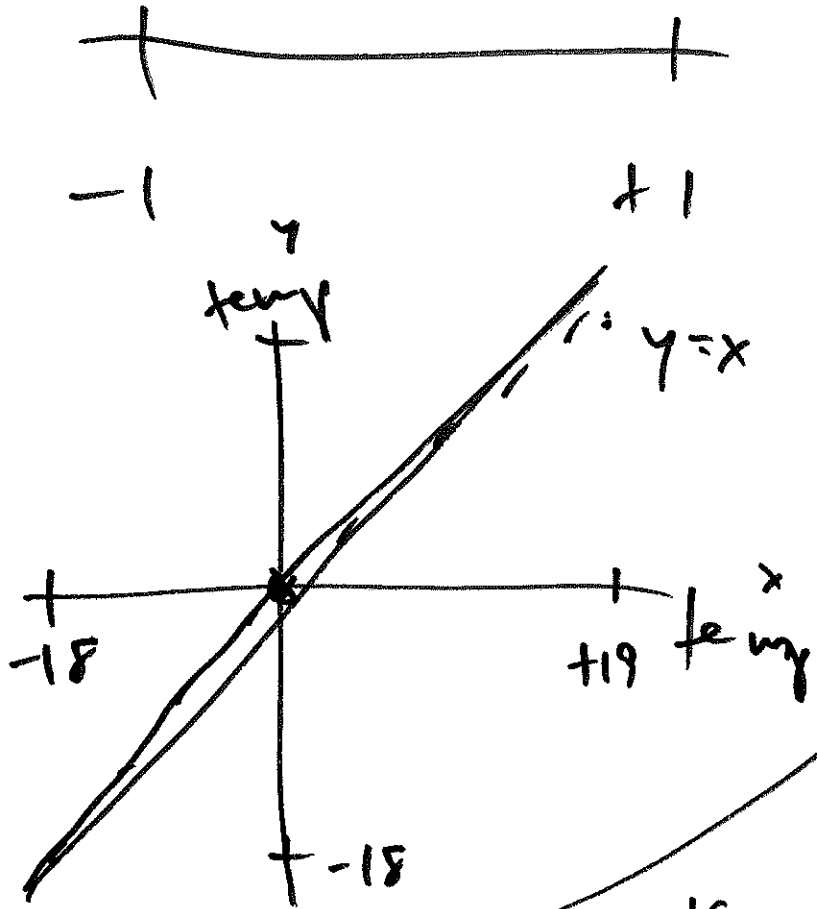
5 is really pract sig diff
from 2: ($r = -0.9904$) is
highly pract sig. diff. from 0

R-74

$$^{\circ}F = \left(\frac{9}{5}\right)(^{\circ}C) + 32$$

1.8

5



y_1	x_1	$n = 8$ \uparrow \downarrow
:	:	
y_i	x_i	
:	:	
y_n	x_n	
mean \bar{y}	mean \bar{x}	
SD s_y	SD s_x	
$r = -.9904$		

$$r = \frac{1}{n} \sum_{i=1}^n \left(\frac{x_i - \bar{x}}{s_x^*} \right) \cdot \left(\frac{y_i - \bar{y}}{s_y^*} \right)$$

$r(x, y) = r(y, x)$

1(a) \checkmark 1(b) $r(^{\circ}C, ^{\circ}F) = r(^{\circ}F, ^{\circ}C)$

R-75 1(a)

This is like case study (wing l., tail l.) in sparrows from class

model
L-(229)

inf. sum.
L-(228)

prop. of ρ
main interest:

estimate
of ρ :

$$r = \underline{\underline{-0.9904}}$$

give -r to be
for var
est of ρ :

$$SE_{IEP}(r) = \frac{1-r^2}{\sqrt{n-3}} = .0085$$

R-(25) f.(16)

approx.
95% CI
for ρ

$$r \pm 2 SE(r)$$

$$-0.9904 \pm 2(.0085)$$

R-(25) just
below
f.(16)

o v. much
hot in

approx. 95%
CI for ρ

.017

95% CI,
so -0.9904

-1.007

-0.990

-0.973

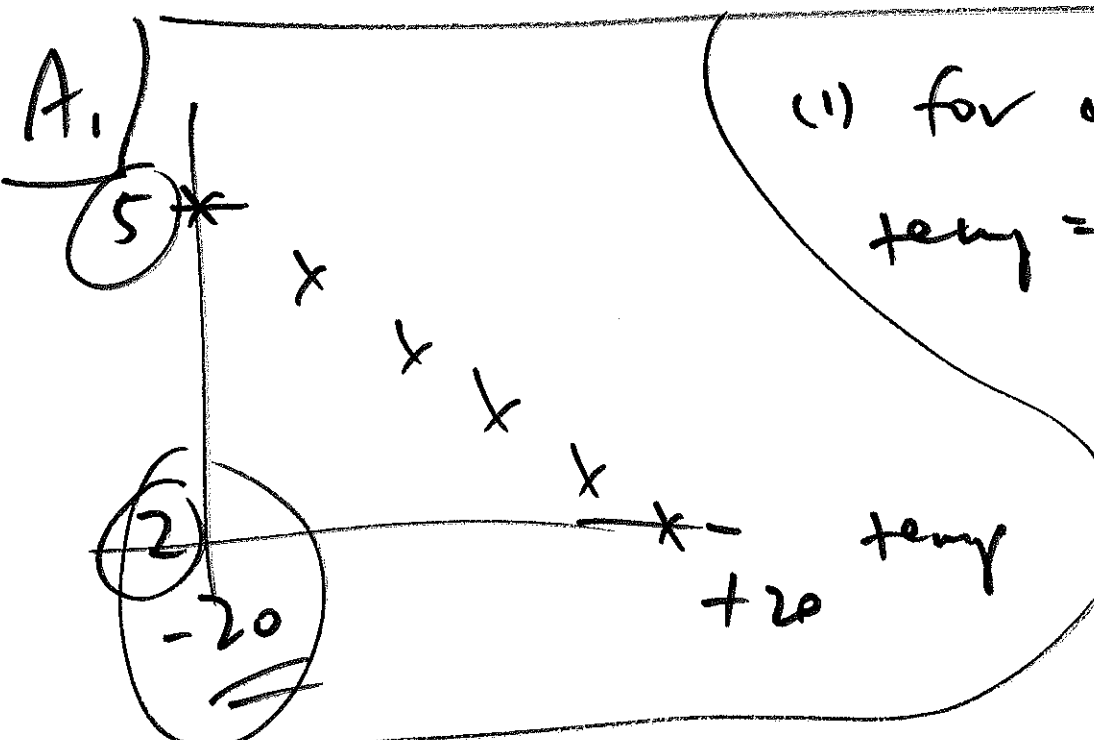
0

is highly diff
stat. sig. from 0

truncation

(-1, -0.973)

Q1) is $r = -.9904$ pract. sig? (9)



(1) for a snow with
temp = -20, pred.
 $\hat{y} = 5$ ml/g/hr

(2) for a
snow with

temp. = +20, $\hat{y} = 2$
↑
predicted
y

(3) 5 vs.
2: really
diff.
↓
in pract.
terms

(4) so $r = -.990$ is highly pract. sig

Q2) is $r = -.9904$ stat. sig. & different

from
A2: yes (devil's advocate) : hull : $\rho = \frac{\text{nothing}}{\text{prop}}$

$$\hat{y} = \hat{\beta}_0 + \hat{\beta}_1 x$$

(predicted y) = (estimated y intercept) + (estimated slope) $\cdot x$

$$\hat{\beta}_1 = r \frac{s_y}{s_x} \quad \hat{\beta}_0 = \bar{y} - \hat{\beta}_1 \bar{x}$$