Chapter 11

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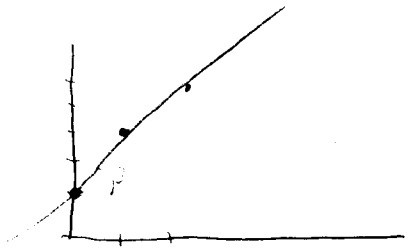


$y = 2x + 1$

x	y
0	1
1	3
2	5

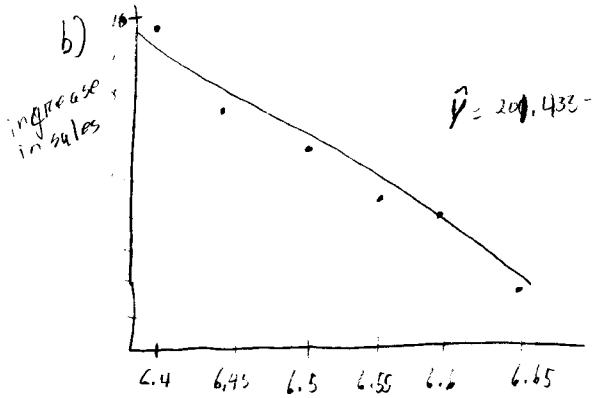
intercept $y = 1$

slope $= 2$

5 $y = -x + 3$

10 a) $\hat{\alpha} = 201.43$ $\hat{\beta} = -30$ $y = 201.43 - 30x$

b)



seems to look good

c) $\hat{y} = 201.433 - 30(6.60) = 3.43\%$

12 a-b) go to STATA enter data twoway (scatter income assets)

- notice Prevedent Federal may be an outlier and it does not look very linear

c) $\hat{\alpha} = -17.896$ $\hat{\beta} = 2.455$ $\hat{y} = -17.896 + 2.455x$

d) $\hat{y} = -17.896 + 2.455(200) = 473.104$

47 a) $\hat{y} = -.333 + 1.4x$

i) twoway (scatter y x) (lfit y x)

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13 $t_{obs} = 5.196$ $d.f. = 5 - 2 = 3$ $t_{crit} = 3.182$

$t_{obs} > t_{crit}$ Reject H_0 that $\beta = 0$ statistically there is a relationship

14 $\bar{y} = 1.2$ $s = .2309$ $t_{\alpha/2}^{d.f.=3} = 2.353$

$1.2 \pm 2.353(.2309) = 1.2 \pm .52 = \{.6798, 1.72\}$

$H_0: \beta = 0$ 20 a) $t_{obs} = 2.69$ $d.f. = 7 - 2 = 5$ $t_{\alpha/2}^{95\%} = 2.571$

$H_A: \beta \neq 0$

$t_{obs} > t_{crit}$ Reject H_0 statistically we are 95% confident that there is an affect of assets on net income

b) main assumptions are about the error term $E(\varepsilon) = 0$ $E(\varepsilon_i \varepsilon_j) = 0$ $E(\varepsilon^2) = \sigma^2$ we can assume are all met.

22. a) $\widehat{INDEX} = 63.9 + .474(income)$ - entered into state use twoway (scatter index income) (lfit index income)
- it is hard to tell if there is a linear relationship but it doesn't look like there is.

b) $\widehat{INDex} = 116 - .377(Price)$

twoway (scatter index price) (lfit index price)
there does appear to be a negative relationship

c) lets do significant tests for beta

a) $H_0: \beta_{income} = 0$
$H_A: \beta_{income} \neq 0$

$t_{obs} = .75$
$d.f. = 10 - 2 = 8$ $t_{crit} = 2.306$ ($\alpha/2 = .025$)

$t_{obs} < t_{crit}$ fail to reject
statistically no relationship

b) $H_0: \beta_{price} = 0$
$H_A: \beta_{price} \neq 0$

$t_{obs} = -3.05$
$d.f. = 10 - 2 = 8$ $t_{crit} = 2.306$

$t_{obs} < t_{crit}$ (in the rejection region)
Reject H_0 this is a better predictor of index

45 a) entered data in regress y x

$\hat{y} = 1 + .7x$

b) twoway (scatter y x) (lfit y x)

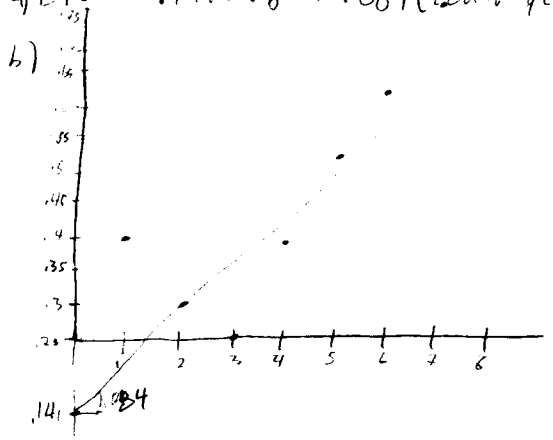
c) $H_0: \beta_1 = 0$ $\quad t_{obs} = 3.656$ $\quad t_{obs} > t_{crit}$ Reject H_0

$H_A: \beta \neq 0$ $\quad d.f. = 3$ $\quad t_{crit} = 3.182$ $\quad \beta_1$ is statistically significant

d) $t_{.025}^{df=3} = 2.353$ $\quad .7 \pm 2.353(.191) = \{.249, 1.15\}$

57 a) EPS = .141786 + .084(coded year)

b)



c) $R^2 = .815$ 81.5% of the total variance in y can be accounted for by x

d) $H_0: \beta = 0$ $\quad t_{obs} = 5.13$ $\quad t_{obs} > t_{crit}$ Reject H_0

$H_A: \beta \neq 0$ $\quad t_{crit} = 2.447$ $\quad \beta$ is statistically significant

d.f. & α two

e) $.084 \pm .016368(2.447) = \{.044, .124\}$

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32. if r is positive then as x increases y increases. if r is negative if x increases y decreases. an r close to 1 signifies high correlation between x and y while an r close to 0 mean there is little correlation between x and y

33 a) 1 b) -1

37 a) $r = \frac{-26.25}{\sqrt{(17.5)(40.468)}} = -.9864$ x and y are highly negatively correlated

b) $(-.9864)^2 = .8576$ I've explained 85% of the variation in Y

39 a) $Y = 307.917 + 34.58X$

b) in STATA corr sales space $\Rightarrow r = .874$ - strong pos relation
look at regression $R^2 = .7636$ - explains 76% of variation

40 a) in STATA twoway scatter men women
because it looks like both men and womens salaries increase with increased schooling I would expect them to be positively correlated

b) skip

c) there is a positive correlation between men and womens salaries but just looking at correlation we can't say anything about why. we think men get higher, growth than women or we think men's mean is higher than womens

52 a) STATA twoway scatter appraised sale

b) STATA twoway (scatter appraised sale)(lfit appraised sale)

c) $t_{obs} = 4.18$ $t_{crit} = 2.228$ $t_{obs} > t_{crit}$

d.f: 10
$\alpha = .05$

reject $H_0: \beta = 0$

Statistically I can say that appraisal value has some relationship to sale price.

d) $R^2 = .6357$ We have explained 63% of the variation in Y