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11/sep/11

Assignment - 3

ECON - Online

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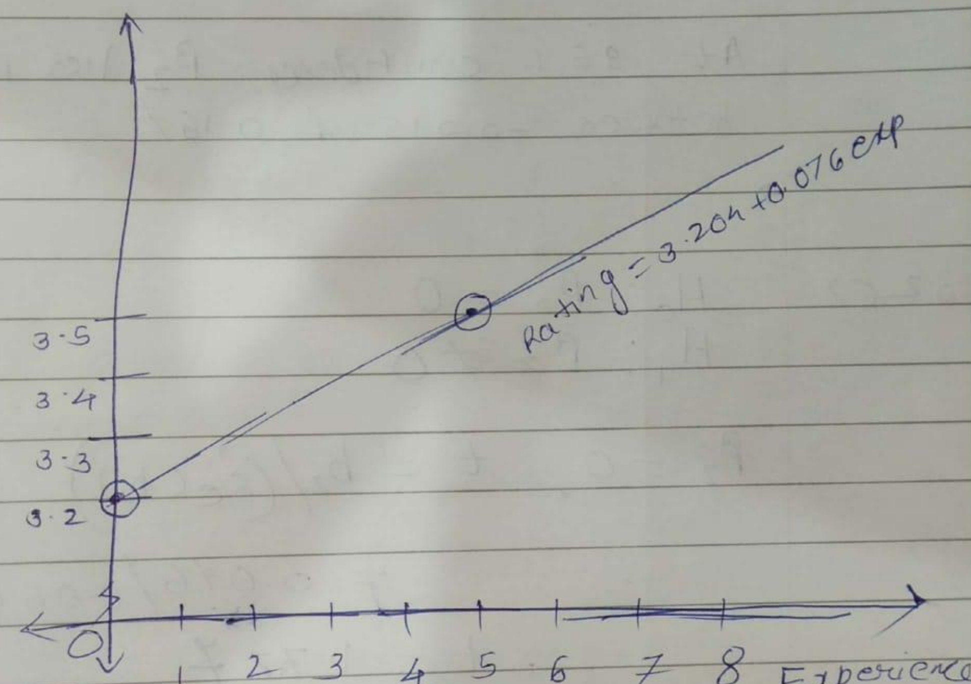
3.2 a)



$$Rating = 3.204 + 0.076\ Exp$$

3.2 b) $N = 24$

So $t_{(95\%, N-2)} = t_{(0.025, 24)}$

$= 2.07387$

$\hat{s}e(b_2) = 0.044$

$b_2 \pm (t) \times (\hat{s}e\, b_2)$

$= 0.076 \pm (2.0738 \times 0.044)$
$= (-0.015,\ 0.167)$

At 95% confidence, β_2 lies in between -0.015 & 0.167

3.2 c) $H_0: \beta_2 = 0$
$H_1: \beta_2 \neq 0$

$\beta_2 = 0, \quad t = b_2 / (\hat{s}e(b_2))$

$= 0.076 / 0.044$

$\therefore t = 1.727$

$t_{critical}$ at 95% $= 2.0738$

As

$-2.0738 < \cancel{1.727}\ 1.727 < 2.0738$

we can not reject the null hypothesis

3.2d)

$H_0 : \beta_2 = 0$

$H_1 : \beta_2 > 0$

$\alpha = 0.05$

$\beta_2 = 0 \quad t = 1.727$

$t_{critical} = t(0.05, 22)$

$= 1.717$

$t > t_{critical}$, we reject the null hypothesis.

$\therefore \beta_2 > 0$

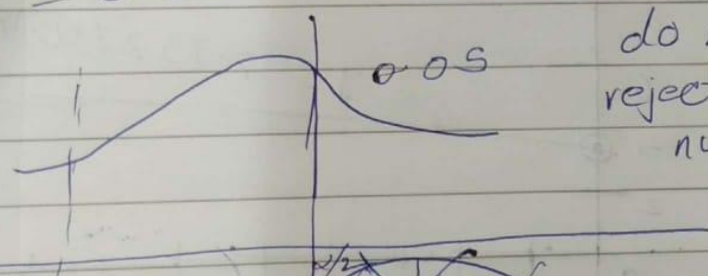
3.2e)

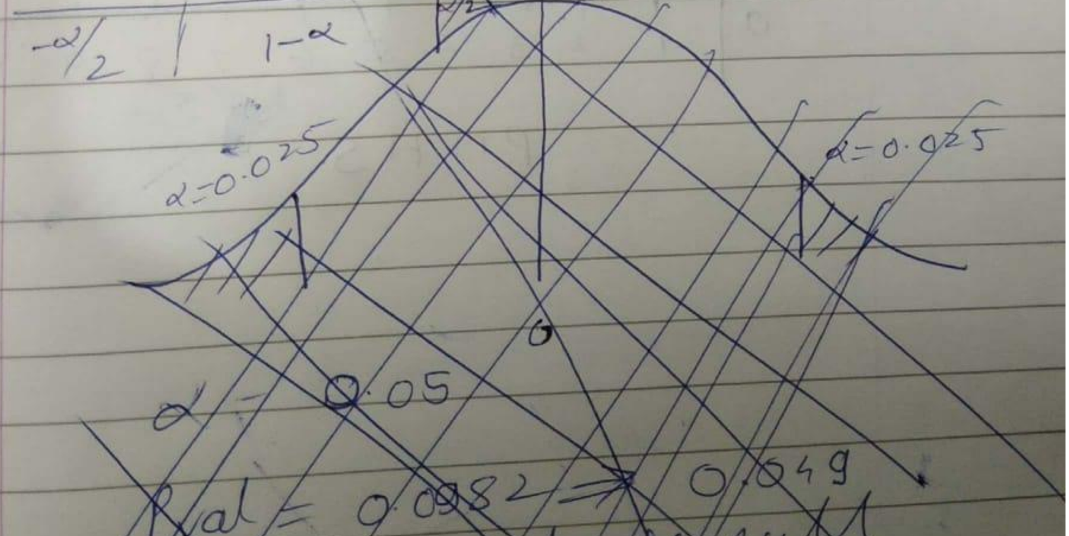
$p\ val = 0.0982$

$\alpha = 0.05$

as $Pval > \alpha$

do not reject the null





~~$\alpha = 0.05$~~

~~$Pval = 0.0982 \Rightarrow 0.049$~~

~~$p\ val < \alpha$ reject the null~~

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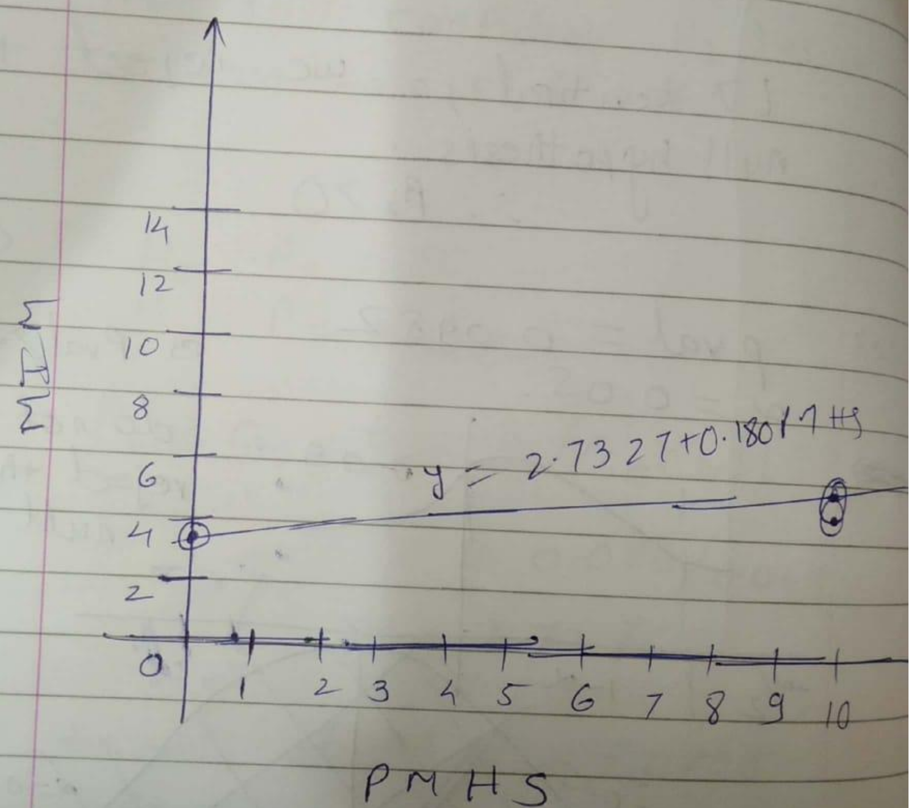
34 a)

$a = \hat{S}_e(a) \times t_a$

$= 2.174 \times 1.257$

$= 2.7327$

$\therefore MIM = 2.7327 + 0.180\, PMHS$



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3.4 b) $\hat{S}e(\beta_2) = \dfrac{b_2 - \beta_2}{t}$

$= \dfrac{0.180}{5.754}$

$\hat{S}e(\beta_2) = 0.312$

3.4 d) β_2 slop. = 0.18 says that for every ~~ad~~ 1% increase in males 18 or older who are high school graduates, mean income of males who are 18 or older increases by 0.18 thousand dollars or 180\$ the +ve sign is also consistant that is more the education more the income.

3.4 e) $N = 51$

$t_{(0.99, N-2)} = t_{(0.99, 49)} = 2.678$

$b_2 \pm (t)(\hat{S}_e \beta_2)$

$= 0.180 + 2.678 \times 0.0312$

$= 0.0965, 0.2635$

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$H_0 : \beta_2 = 0.2$
$H_1 : \beta_2 \neq 0.2$

$$t = \frac{b_2 - \beta_2}{se(\beta_2)}$$

$$= \frac{0.18 - 0.2}{0.0312}$$

$$t = -0.6410$$

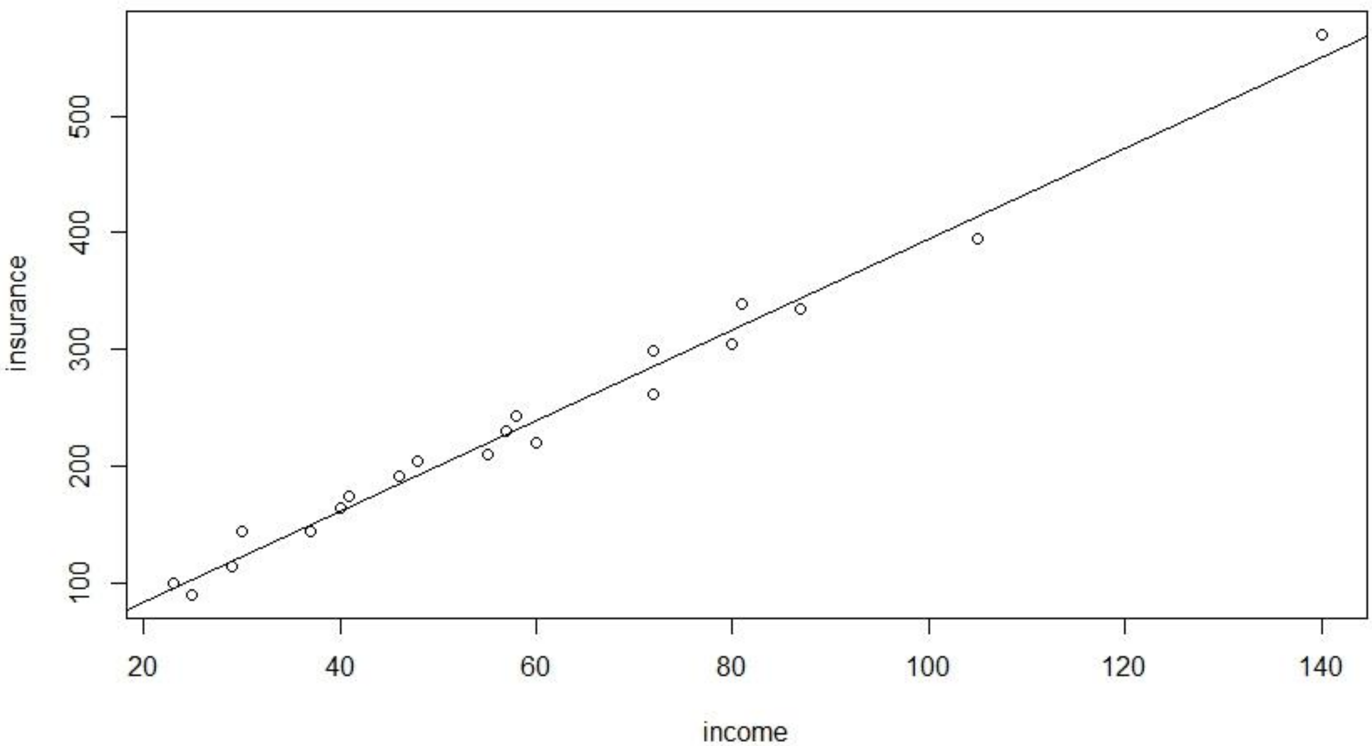
$$t_{critical} = t(0.975, 49)$$

$$= \pm 2.01$$

~~t = 0~~

$t = -0.639$ does not lie in the rejection rejon so we do not reject the null hypthesis.

We can say that 1% increase in 18 yr ~~of~~ or older high school graduate males leads to 180$ increase in the income of 18 yr or older male



insurance
income
100
200
300
400
500
20
40
60
80
100
120
140

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Q. 3.5 Plotted using R

a) Estimated slop = 3.88 } Insurance

Intercept = 6.85 } = 6.85 + 3.88 × income

3.5 b) Insurance = 6.85 + 3.88 income

i) If income increases by \$1,000 the insurance will change (increase) by 3.88 thousand dollars or \$3880.

ii) $\hat{Se}(\beta_2) = \dfrac{b_2 - \beta_2}{t}$

$\hat{Se}(\beta_2) = 0.1121$ (from R)

we can use this for building an interval

$b_2 \pm t_{critical} \hat{Se}(\beta_2)$

c) $H_0 : \beta_2 = 5$

$H_1 : \beta_2 \neq 5$

$\alpha = 5\%$

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$$t_{critical} = t_{(0.975, N-2)}$$

$$= t(0.025, 18)$$

$$= \pm 2.101$$

$$t_{stat} = \frac{b_2 - \beta_2}{se(\beta_1)} = -9.99$$

$t_{stat} < t_{critical}$

We can reject the null hypothesis
i.e. ~~in~~ we can say that
insurance will not go up by
$5,000 for every $1,000
income increase.

d) $H_0 : \beta_2 = 1$
$H_1 : \beta_2 \neq 1$

$$t_{stat} = \frac{b_2 - \beta_1}{\hat{se}(\beta_2)} = \cancel{2.69}$$

$$= 25.69$$

$t_{critical} = \pm 2.101$

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$t_{stat} > t_{critical}$

we reject the null hypothesis ~~i.e. slope of relationship is~~
~~<0~~

e) Insurance = 6.85 + 3.88 * Income

we can say that ~~for~~ every additional \$1000 increase in ~~co~~ income, the insurance held will increase by \$3880.
The p value of the ~~coeff~~ coeficient is less than ~~the~~ α so we can say that the coeficient is significant.

3.7 a) the slope of $\beta = 1$ says that the retun increases by the same amount as increase in the risk.
$r_f - r_j$ increases in same amount as when $r_m - r_f$ increases

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$H_0: \beta_1 = 1$

$H_1: \beta_1 \neq 1$

$\alpha = 5\%$, $N = 132$

$t_{critical} = t(0.025, 130)$

$= \pm 1.978$

- G. E.

~~t stat = 0.~~

$$t_{stat} = \frac{0.8589 - 1}{0.0955} = -1.47$$

Do not reject Null Hypothesis

- Disney

$$t_{stat} = \frac{0.9145 - 1}{0.1201} = -0.711$$

Do not reject the null hypothesis

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- G.M.

$$t_{stat} = \frac{1.468 - 1}{0.1972} = 0.744$$

Do not reject null hypothesis

- IBM

$$t_{stat} = \frac{1.482 - 1}{0.1231} = 1.203$$

Do not reject the null

- Microsoft

$$t_{stat} = \frac{1.259 - 1}{0.1568} = 1.657$$

Do not reject the null hypothesis

- Exxon

$$t_{stat} = \frac{0.4612 - 1}{0.0886} = -6.08$$

Reject the null hypothesis

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b) for Exxon

$H_0: \beta_2 \geq 1$

$H_1: \beta_2 < 1$

$$t_{stat} = \cancel{b_2 - 1} \; \frac{0.4612-1}{0.0886}$$

$$= -6.08$$

$t_{critical} = t_{(0.95, 130)} = -1.657$

$t_{stat} < t_{critical}$

Reject the null hypothesis

$\therefore$ stock is defensive.

c) $H_0: \beta_2 \leq 1$

$H_1: \beta_2 > 1$

$t_{critical} = t_{(95\%, 130)} = 1.657$

$$t_{stat} = \frac{1.259-1}{0.1568}$$

$t_{stat} = 1.6517$

$\therefore$ reject the null hypothesis

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Interpretation → stock is aggressive

d) $b_2 = 1.2599$ & $\hat{se}(b_2) = 0.1568$

$t_{critical} = 1.9783$

$b_2 \pm t_{critical} \times (\hat{se}(b_2))$

$= 1.2599 \pm (1.9783 \times 1.568)$

$= (1.57, 0.9498)$

Interval between 1.57 & 0.9498.

the slope is between 0.95 & 1.57 that is we can say ~~to~~ invester that stock is most of the time aggressive with 95% ~~chance of error~~ confidence.

e)

e) $H_0: \beta_1 = 0$
$H_1: \beta_1 \neq 0$

$t_{critical} = t(0.975, 130) = 1.978$

- Disney

$t_{stat} = \frac{-0.0036}{0.0069} = -0.5217$

do not reject the null

- GE

$t_{stat} = \frac{-0.0053}{0.00551} = -0.9618$

Do not reject the null

- GM

$t_{stat} = \frac{-0.0072}{0.0113}$

$= -0.637$

Do not reject the null

- IBM $t_{stat} = \frac{0.0102}{0.0071} = \cancel{1.46}$ 1.436

Do not reject the null

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- Microsoft

$$tstat = \frac{0.0137}{0.0090} = 1.522$$

do not reject the null

- Exxon

$$tstat = \frac{-0.0079}{0.0051} = -1.549$$

do not reject then

$\therefore$ We can not reject the null hypothesis that intercept term in CAPM model for each stock is zero.

Q. 3.9

a) $\alpha = 0.05$

$H_0: \beta_2 = 0$

$H_1: \beta_1 \neq 0$

~~$b_2 = 0.8859$~~

~~$b_1 =$~~

$b_1 = 50.848$ $\quad$ $\hat{se}_{b_1} = 1.0125$

$b_2 = 0.8859$ $\quad$ $se_{b_2} = 0.1819$

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$t_{c_{ritical}}(0.975, 31) = 2.040$

$t_{stat} = \frac{b_2}{\hat{se}_{b_2}} = \frac{0.8859}{0.1819}$

$= 4.870.$

As $t_{stat} > t_{critical}$

reject the null hyrothesis

$\therefore$ We can say that growth has effect on election results.

b) $b_2 \pm t_c \times \hat{se}(b_2)$

$= 0.8859 \pm 2.040 \times 0.1819$

~~= 0.8859 +~~
~~0.514~~

$= -0.514$ & 1.256

$\therefore$ b_2 lies in between -0.514 & 1.256

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c) $b_1 = 53.4077$ $\hat{se}\, b_1 = 2.25$

$b_2 = -0.4443$ $\hat{se}\, b_2 = \cancel{-0.741}$ 0.5999

$H_0: b_2 = 0$

$H_1: b_1 \neq 0$

$\alpha = 5\%$

$t_{critical}(0.975, 31) = 2.040$

$t_{stat} = \frac{b_2}{\hat{se}\, b_2} = \cancel{\frac{-0.4443}{-0.741}}$

$= \frac{-0.4443}{0.5999}$

$= -0.740$

$t_{stat} < t_{critical}$

We can not reject the null hypothesis that inflation has no effect on election

d)

$b_2 \pm t_{critical} \times \hat{se}\, b_2$

$= -0.443 \pm 2.40 \times 0.599$

$= -1.668 \text{ \& } 0.779$

$\therefore b_2$ lies in $-1.668 \text{ \& } 0.779$

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e) Inflation = 0

$H_0: \alpha \geq 50$

$H_1: \alpha < 50$

$$t_{\text{stat}} = \frac{53.4077 - 50}{2.2500}$$

$$= 1.5145$$

$t_{\text{critical}} = 1.696$

$t > t_c$

∴ we can reject null hypothesis

constructing 95% confidence interval

$= b_2 \pm t_c \, \hat{se}(b_2)$

$= -0.4443 \pm 1.696 * 2.25$

$= -4.2603$ & 3.3717

When inflation is zero, we can reject the null hypothesis

f) Inflation = 0.02

$Vote = 53.4077 - 0.4443 \times 2$

$= 52.519$

95% confidence interval

$t_c = 2.040$

$= 52.519 \pm [2.040 \times 1.7231]$

$= 52.519 \pm 3.515$ ~~3.515~~

$= 49.003 \ \& \ 56.034$