Question 2.6

Y = -240 + 8X

a) This means that if temperature(Fahrenheit) increase by one unit then the sales will likely go up by 8 cans of sodas. Given that all other variables remain constant.
Y-intercept is -240 meaning that on 0 F will be too cold for any event and the seller will sell no soda. In fact, she will have losses because while she is selling no sodas but cost of doing business is still there.

b) At 80F we are expected to sell Y= -240 + 8(80) = 400 cans of sodas.

c) 0 = -240 +8X
240/8 =X
X= 30 F
Below 30F it is expected that sales will be 0 cans of sodas

Estimate regression line
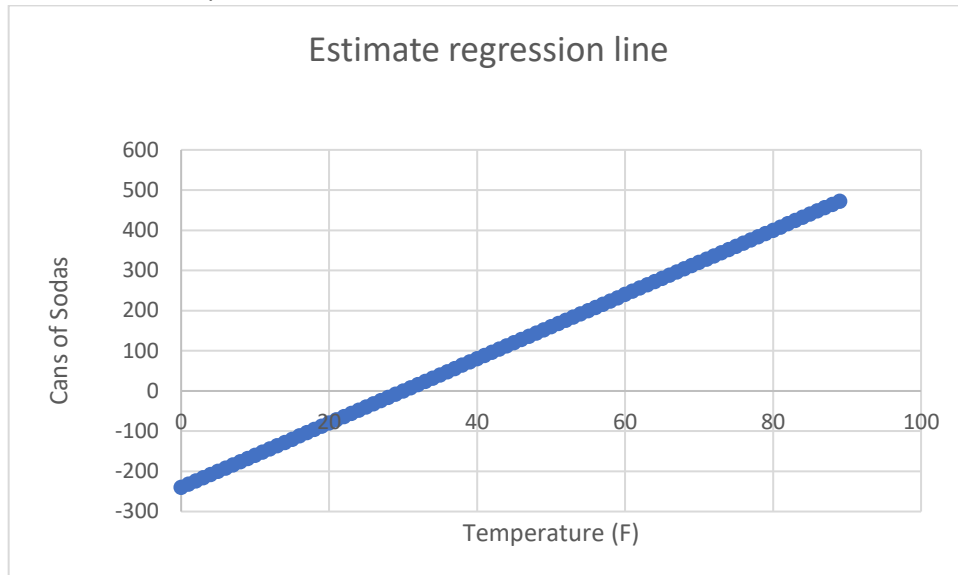
d)

Question 2.7

a) Error variance = 2.04672   N=51

$$\hat{\sigma}^2 = \frac{\sum \hat{e}_i^2}{N-2}$$

2.04672 * (51-2) = 100.28 is the Sigma e^2

100.29 is the sum of the squared least squares residuals

b) $$s\hat{e}(b_2) = \sqrt{v\hat{a}r(b_2)}$$

    estimated variance of b2 is 0.00098
    standard error = sqrt(0.00098) = 0.0313

$$v\hat{a}r(b_2) = \frac{\hat{\sigma}^2}{\sum (x_i - \bar{x})^2}$$

    2.04672/0.00098 = sigma(x-xmean)^2
    2088.48 = sigma(x-xmean)^2

c. Xi = Percentage of males(above 18 years) who are high school graduates
   Yi = State's mean income of males who are 18 or above in thousands of dollars

Interpretations: Increase of 1% in Xi will increase the Yi by 0.18*1000 = $180

d. Y= b1 + b2*X
   15.187 = b1 + 0.18*69.139
   B1 = 2.741

   e) Find sigma(Xi)^2 for the above econometric model.

      2088.48 = sigma(x-xmean)^2   and in d) X mean = 69.139

    Sigma(Xi-Xavg)^2 = Sigma (Xi)^2 -N*Xavg^2
    2088.48 =   Sigma(Xi)^2 – (51)*(69.139)^2
    2088.48 + 243790 = sigma(Xi)^2
    245,879= Sigma(Xi)^2

f. Yi = b1 + b2(Xi) + e
   12.274 = 2.741+ (0.18)(58.3) + e
   12.274 = 2.741 + 10.494 + e
   12.274 = 11.74 + e
   12.274-11.74 = e
   -0.96 = e

Question 2.10

   a. It is an econometric model because it follows the format of y= beta1 + beta2X
     Where y = rj-rf   and x = rm-rf   That makes Beta 1 the Alpha which should be close to zero and Beta2
     the beta which decided how aggressive or defensive the stock is.
   b. The econometric model for stocks are as follows.

y(rj-rf)	beta1(the alpha value)	beta2(beta value)	Comment
disney	-0.00366	0.914	Aggressive. Close t0 1
genelec	-0.00532363	0.858	Lightly aggressive
GM	-0.0072	1.146	Aggressive
ibm	0.01	1.148	Aggressive
MSFT	0.013	1.259	Most aggressive
XOM	-0.0079	0.461	Most defensive

According to Beta value XOM (0.461) is the most defensive stock and MSFT (1.259) is the most aggressive stock.

c. No stock has a true 0 alpha but mostly all of the stocks are very close to zero. With the exception of MSFT.
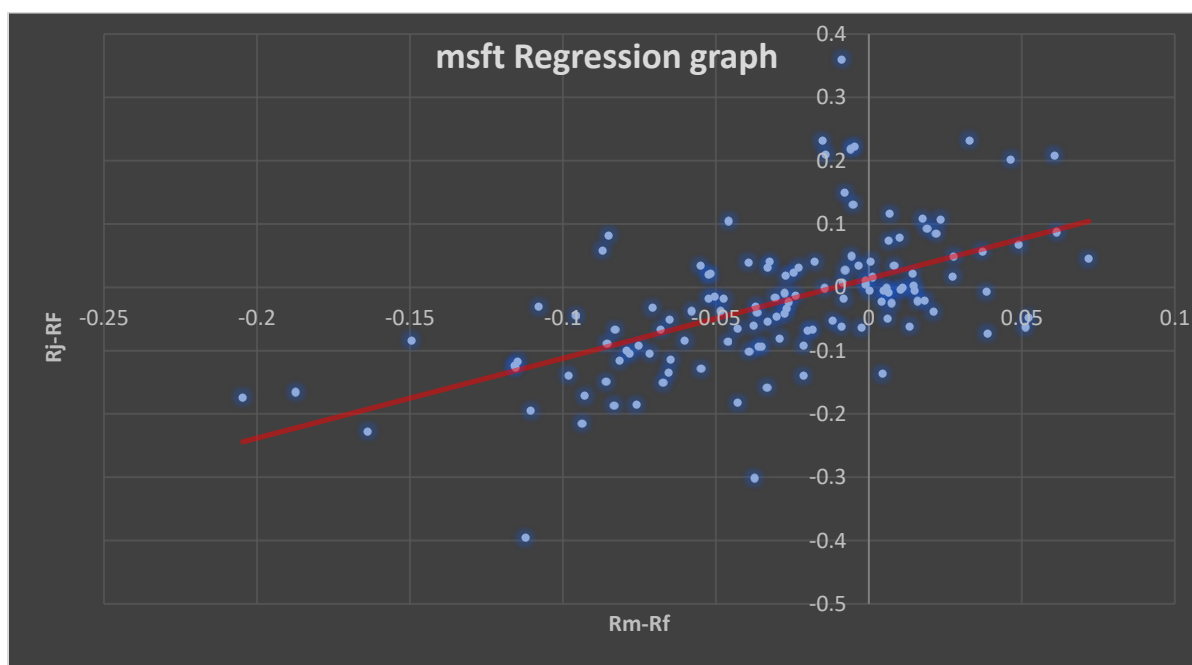
d.

Company	MSFT	GE	GM	IBM	DISNEY	XOM
Beta (without y intercept)	1.138086	0.9061	1.21	1.0577	0.947	0.531
Beta with Y intercept	1.259	0.858	1.146	1.148	0.91	0.461

There is significant difference when Intercept is 0. Beta values change and most stocks become more aggressive as alpha is set to 0. MSFT is the only exception
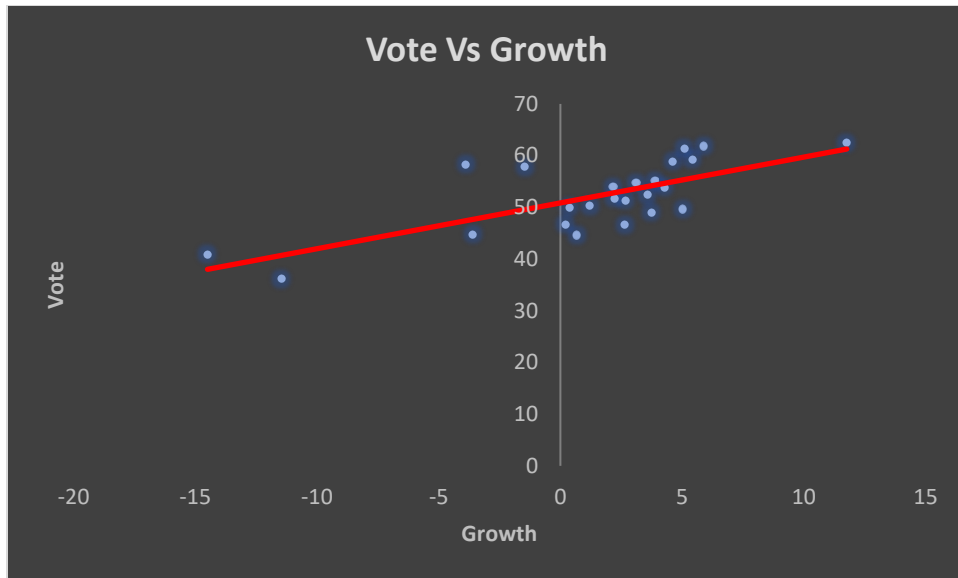
Question 2.14
a.
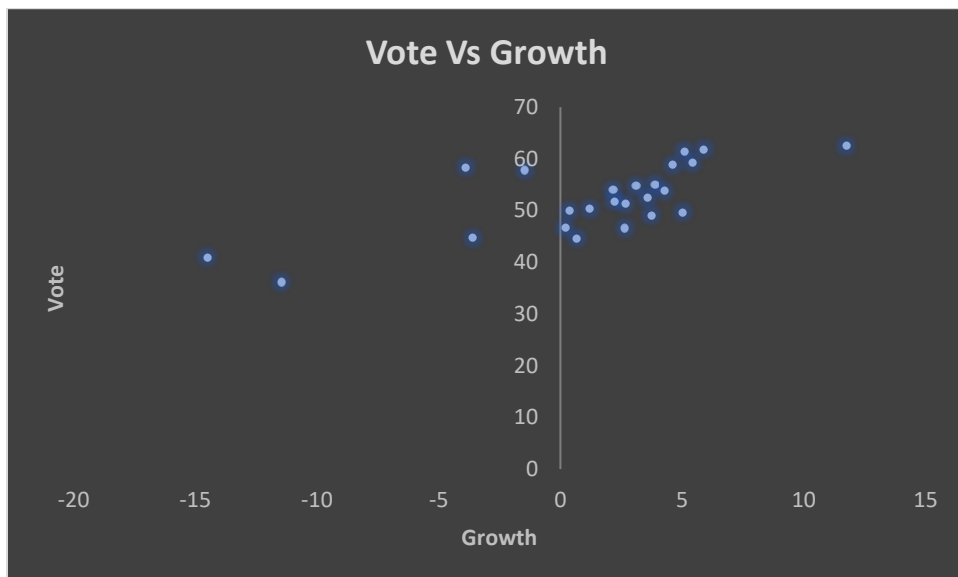
Seems like a positive association. When growth goes down then Vote goes down and when Growth goes up then Vote goes
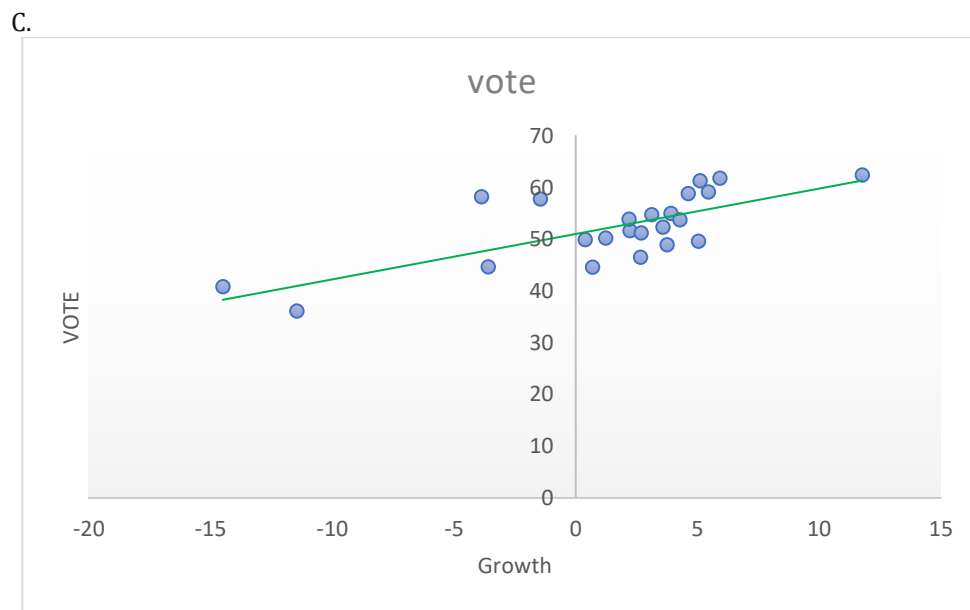
Data time range is from 1916-2008

b.

VOTE = 50.84 + 0.885*GROWTH

This shows that Vote y intercept is 50.8% and with every one unit increase in Growth the voting will increase by 0.88%. This is not that big of an influencing factor.

C.

.

Time Range: 1916-2004

Vote = 51.05 + 0.877* GROWTH

Predicted 2008 result is   Growth @ 2008 = 0.22

VOTE = 51.05 + 0.877 * 0.22 = 51.24
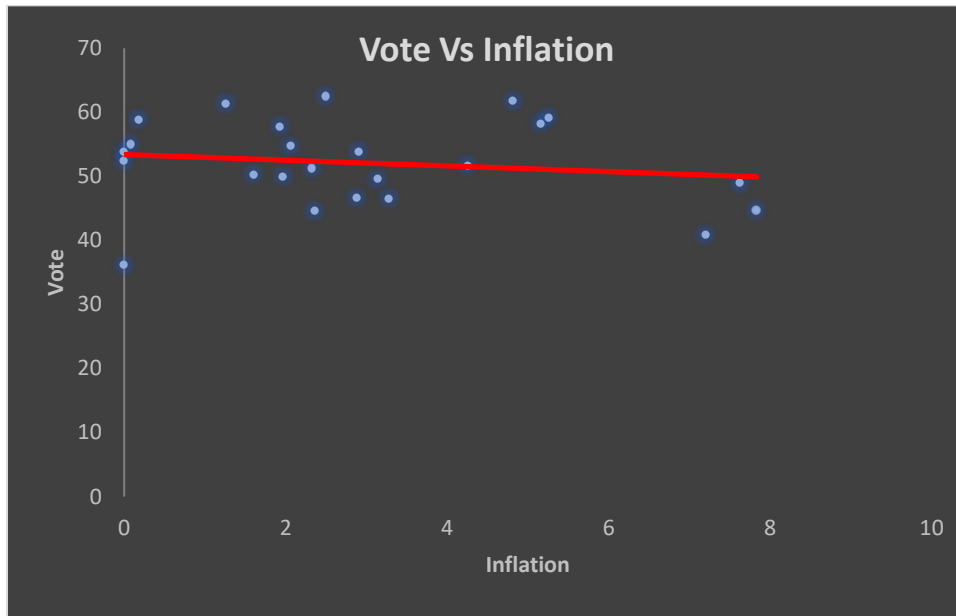
Actual = 46.6

Error = 51.24 – 46.6 = 4.64

It is off by 4.64

D.

VOTE vs Inflation

There seems to be a negative correlation between Vote and Inflation. More inflation means less Vote.

Vote = 53.407 – 0.44*Inflation