#read data from external file.

data5 <- read.csv("F:/Assigmnents/Appstat/data5.csv", sep="")

View(data5)

#Assign predictor variable x is the latitude

x<-data5$Lat

#mean of x as no. of variable are 48

xbar<-mean(x)

c(xbar)= **39.43958**

#Assign response variable y is the mortality

y<-data5$Mort

#mean of x as no. of variable are 48

ybar<-mean(y)

c(ybar)= **152.75**

#the point of estimate b1 for B1

b1<-sum((x-xbar)\*(y-ybar))/sum((x-xbar)\*(x-xbar))

c(b1)= **-6.031333**

# t value as (1-alpha/2 = 0.975) and (n-2 = 46)DOF

t<-qt(0.975,46)

c(t)= **2.012896**

#bo value

bo<-ybar-b1\*xbar

c(bo)= **390.6232**

#estimated Yhat of response variable y

yhat<-bo+b1\*x

#MSE

MSE<- sum((y-yhat)\*(y-yhat))/46

c(MSE)= **348.7359**

#Standard error (Se) of b1

s<-sqrt(MSE)/sqrt(sum((x-xbar)\*(x-xbar)))

c(s)= **0.5905047**

#Confidence Interval C.I. [a,b]

a<-b1-t\*s

c(a)= **-7.219957**

b<-b1+t\*s

c(b)= **-4.842708**

# verify using R function

fit<-lm(y~x)

Call:lm(formula = y ~ x)

**Coefficients:**

**(Intercept) x**

**390.623 -6.031**

confint(fit)

**2.5 % 97.5 %**

**(Intercept) 343.431468 437.815026**

**x -7.219957 -4.842708**

summary(fit)

Call: lm(formula = y ~ x)

Residuals:

Min 1Q Median 3Q Max

-38.527 -12.470 1.701 12.595 44.599

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 390.6232 23.4447 16.66 < 2e-16 \*\*\*

x -6.0313 0.5905 -10.21 2.07e-13 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

**Residual standard error: 18.67 on 46 degrees of freedom**

**Multiple R-squared: 0.694, Adjusted R-squared: 0.6873**

**F-statistic: 104.3 on 1 and 46 DF, p-value: 2.068e-13**

#solution of Part2 for question5

#SSR

SSR<-(sum((yhat-ybar)\*(yhat-ybar)))

c(SSR)= **36381.15**

#SSE

SSE<-(sum((y-yhat)\*(y-yhat)))

c(SSE)= **16041.85**

#SST

SST<-(sum((y-ybar)\*(y-ybar)))

c(SST) **= 52423**

#finding R-Square

rsquare<- SSR/SST

c(rsquare)= **0.6939921**

plot(x,y)

lines(x,yhat,col="red", lwd ="2")

