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# R Code for HW5                              Sta108, Fall 2007, Utts

### Problem 6.15
Data=read.table("~/Documents/School/Sta108utts/CH06PR15.txt")
names(Data)=c("Y","X1","X2","X3")

#(b) #print scatter-plot matrix and correlation matrix
pairs(Data, pch=19)
cor(Data)

#(c) #fit regression model (6.5)
Fit = lm(Y ~ X1 + X2 + X3, data=Data)
Fit

### Problem 6.16
#(a) #Test for regression relation. See F-statistic in summary()
summary(Fit)
qf(1-0.10, 4-1, 46-4)     #F-value  F(1-alpha, p-1, n-p)

### Problem 6.17
#(a) #90% the confidence interval for mean response at Xh
Xh=data.frame(X1=35, X2=45, X3=2.2)
predict(Fit, Xh, se.fit=TRUE, interval="confidence", level=0.90)

#(b) #90% prediction interval for mean response at Xh
predict(Fit, Xh, se.fit=TRUE, interval="prediction", level=0.90)

### Problem 7.5
#(a) #First, run the model as with X2 then X1 then X3. Then print the ANOVA
table with Extra Sum of Squares
Fit75 = lm(Y ~ X2 + X1 + X3, data = Data)
anova(Fit75)

#(b) #perform F-test. See ANOVA table
dim(Data)
qf(1-0.025, 1, 46-4)     #F-value  F(1-alpha, 1, n-p)

### Problem 7.26
#(a) #fit regression model (6.1)
Fit2 = lm(Y ~ X1 + X2, data=Data)
Fit2

#(b)
summary(Fit2)

#(c)
#Check for SSR(X1)
Fit3 = lm(Y ~ X1 + X3, data=Data)
anova(Fit3)
#Check for SSR(X1|X3)
Fit3 = lm(Y ~ X3 + X1, data=Data)
anova(Fit3)
#Check for SSR(X2)
Fit4 = lm(Y ~ X2 + X3, data=Data)
anova(Fit4)
#Check for SSR(X2|X3)
Fit4 = lm(Y ~ X3 + X2, data=Data)
anova(Fit4)
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