Exam 2 - Question 5

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Problem 5 - Do Problems 7.8 and 7.10 on page 290

- Hierarchical Regression (Blocks) should be used
- Partial coefficients of determination can be found using either Hierarchical or correlates of SPSS

Problem 7.8 - Refer to the realestate data from the previous problem. Test whether X2 and X3 can be dropped from the regression model given X1 and X4 are retained. Use $\alpha = 0.01$ What is the p-value and the decision rules.

Test whether multiple $\beta_K = 0$

Test whether both X2 and X3 should be removed from the model

$H_0 : \beta_2 = \beta_3 = 0$

H_a: not both β_2 and β_3 equal zero

Do a simple anova test of reduced against full model and assess partial F test to test whether at $\alpha = 0.01$ the models are different. Note that a new p-value is needed because R's default uses $\alpha = 0.05$

```
setwd("C:\\Users\\AdamMcQuistan\\Documents\\ISQA 8340\\Exam 2")
df <- read.csv("data/6.18.csv")
names(df)[2:6] = c("Y", "X1", "X2", "X3", "X4")

full <- lm(Y ~ X1 + X4 + X2 + X3, data=df)
reduced <- lm(Y ~ X1 + X4, data=df)
aov_result <- anova(reduced, full)
F_stat <- aov_result$F[2]
F_crit <- qf(0.99, aov_result$Df[2], aov_result$Res.Df[2])
p_val <- 1-pf(q=F_stat, 2, aov_result$Res.Df[1])
conclusion <- ifelse(F_stat <= F_crit, "Conclude Null Hypthosis", "Reject Null Hypthosis")
cat("F* =", F_stat, ", F crit (0.99,",  aov_result$Df[2],
    ",",  aov_result$Res.Df[2], ") =", F_crit, "\n", conclusion,", Pvalue = ", p_val, sep=" ")
```

```
## F* = 10.9389 , F crit (0.99, 2 , 76 ) = 4.89584
##  Reject Null Hypthosis , Pvalue =  6.492294e-05
```