Chapter 10(Edition 8): 10.7, 10.8, 10.10

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10.7

The brake horsepower developed by an automobile engine on a dynamometer is thought to
be a function of the engine speed in revolutions per minute (rpm), the road octane number
of the fuel, and the engine compression. An experiment is run in the laboratory and the data
that follow are collected:

```
Brake.HP = c(225,212,229,222,219,278,246,237,233,224,223,230)
RPM = c(2000,1800,2400,1900,1600,2500,3000,3200,2800,3400,1800,2500)
RON = c(90,94,88,91,86,96,94,90,88,86,90,89)
Compression = c(100,95,110,96,100,110,98,100,105,97,100,104)
automob = data.frame(Brake.HP,RPM,RON,Compression)
```

(a) Fit a multiple regression model to these data.

(b) Test for significance of regression. What conclusions can you draw?

(c) Based on t-tests, do you need all three regressor variables in the model?

10.8

Analyze the residuals from the regression model in Problem 10.7. Comment on model adequacy.

10.10

Consider the 2^4 factorial experiment in Example 6.2. Suppose that the last observation is
missing. Reanalyze the data and draw conclusions. How do these conclusions compare with
those from the original example?