

# Dataset Exercises

## Chapter 3

1. Run the three bivariate regressions of acceleration on the other three variables.

Regression analysis is found under Analyze...Regression...Linear. After entering the dependent variable (Y), enter the independent or predictor variable(s) (X) (others). The method should be Enter (the default). Note, both Y and X must be in SPSS as numeric variables.

Estimate the following equations:

$$Y_{11} = b_{01} + b_{11}X_{11} + u_1$$

$$Y_{12} = b_{02} + b_{12}X_{21} + u_2$$

$$Y_{13} = b_{03} + b_{13}X_{31} + u_3$$

Where:

$Y_{1s}$  are time to accelerate

$X_{11}$  are horsepower

$X_{21}$  is vehicle weight

$X_{31}$  is miles per gallon

- Make ACCEL the dependent variable.
- For independent variables, pick
- ENGINE (engine displacement, cubic in.)
- HORSE (horsepower)
- WEIGHT (vehicle weight in lbs.)
- Ignore "method," but you can choose "stepwise." if you wish
- For "statistics," pick– "estimates,"– "model fit,"– " $R^2$  change," and "descriptives"
- Under "options," make sure that "include constant in equation" is checked

Interpret the coefficients after putting them into a suitable table like those shown in the book.

2. Calculate the 't' ratios from the equations by dividing the coefficients by their standard errors. Compare your calculated 't' ratios with those provided by the statistical package. The two figures should be nearly identical bar the effect of some rounding on your calculator.

3. Interpret the results in terms of sign significance and size.

4. Explain what the use and meaning of the critical significance values are which occur in the last column of all your regression results.

5. Do one-sided 't' tests using your bivariate regressions from the earlier weeks

- at the 10% level for the coefficient on miles per gallon being  $<0$
- at the 5% level for the coefficient on horsepower being  $<0$
- at the 10% level for the coefficient on engine weight being  $<0$

6. Carry out a multiple regression of acceleration on the variables: for horsepower, weight and mile per gallon .i.e.

Estimate the following equation:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + u$$

Where:

- Y is time to accelerate
- X1 is horsepower
- X2 is vehicle weight
- X3 is miles per gallon

7. Compare the coefficients you have just obtained with those from the corresponding bivariate regressions.