CHAPTER 18

Appendix

Logistic Regression with Excel, JMP, Minitab, SPSS, CrunchIt!, R, and a TI-83/-84 Calculator

Logistic regression uses a binary outcome variable. The goal is to model the probability of a "success" using one or more predictors.

Excel cannot do logistic regression.

The response variable for logistic regression must have modeling type "nominal" or "ordinal." To assign the roles properly, right-click the column name of the response variable and select "Value Ordering." The category that indicates a success should come first in this ordering. Click "Reverse" at the bottom right, if needed.

1. Click **Analyze → Fit Y by X**.
2. Select the binary variable and click "Y, Response."
3. Select X variable and click "X, Factor."
4. Click **OK**.

For more than one predictor, use **Analyze → Fit Model**.

1. Use **Stat → Regression → Binary Logistic Regression → Fit Binary Logistic Model**.
2. Click to select and enter the binary response variable into the box labeled "Response."
3. There are two options for the data format. Choose "binary response/frequency" if data are entered one row per case/observation or if data have an additional column that gives the frequency that each combination of predictor(s) and response occurred. Choose "event/trial" if data are entered with a column of the number of "successes" and the number of trials for each combination of predictor variable(s).
4. For the response/frequency format, select and enter the response variable into the "Response" box, designate which category of that variable represents a "success," and (if needed) select and enter the frequency variable.
   For the "event/trial" format, select and enter the variables that correspond to the event of interest, the number of times that the event occurred, and the number of trials.

5. Click to select and enter the continuous predictor(s) into the box. Click to select and enter any categorical predictors into their box.
6. If desired, use **Graphs** to define residuals plots and **Model** to refine the predictors (add interaction terms, for example).
7. Click **OK**.

SPSS

1. Click **Analyze → Regression → Binary Logistic**.
2. Click to select and enter the binary dependent variable into its box.
3. Click to enter the predictor(s) into the "Covariates" box.
4. Click **OK**.

CRUNCH IT!

CrunchIt! can only do logistic regression with one predictor.

1. Use **Statistics → Regression → Logistic**.
2. Use the drop-downs to select the binary response and predictor variables.
3. Use the drop-down to define the binary value that designates a success.
4. Click **Calculate**.

TI-83/-84

TI calculators cannot do logistic regression.

R

Use the following commands to calculate and display a logistic regression. Note that additional predictors can be added in the model statement:

```
> model <- glm(Response ~ predictor, family=binomial)
> summary(model)
```