

## Homework 3

Due Monday, February 2

Moore: Ch 3 # 1-11, 13, 14, 26, 27, 29, 31, 45, 46, 48

### SPSS Project: Missouri 3rd grade MAP scores

This problem uses the file `mo_3rd_MAP_06-08.sav`. This file contains 2006-8 summary information for 3rd grade performance on the Missouri Assessment Program (MAP) test, a federally mandated exam given to grade school children.

(Source: Missouri Department of Elementary and Secondary Education, <http://dese.mo.gov/schooldata>)

#### A. Normal or not?

Consider the variables `BELOW_BASIC_PCT`, `BASIC_PCT`, `PROFICIENT_PCT`, and `ADVANCED_PCT`, which give the percentages of students at various levels.

Which of these are close to normal? Describe the ones that are not normal, and explain why they look the way they do.

Describe the distribution of the variable `REPORTABLE`, the number of students with reportable scores. Define a new variable `LOGREPORTABLE` which is the natural log (LN) of `REPORTABLE`. Make a histogram of `LOGREPORTABLE` that shows the normal curve and print it. What effect did taking the logarithm have?

#### B. Extreme values.

Select just the 2008 results for Mathematics.

Make a boxplot of `MAP_INDEX`, the overall MAP score for each district. You should see two extreme outliers. Which districts are they?

Explain why it is reasonable to remove the two extreme outliers from the data set. Delete them and repeat the boxplot.

A new extreme outlier appears. Explain why it is reasonable to remove it. Delete it and repeat the boxplot. At this point, you should have no extreme outliers. Which of the remaining districts have the best and the worst MAP scores?

Print your final boxplot.

#### C. z-scores

Continue with your trimmed 2008 data in Mathematics. Make a histogram of `MAP_INDEX` with the normal curve shown and print it. Would you say the variable is normal?

- Compute the z-scores for the best and worst districts in this data set.
- Compute the z-score for St. Louis City and explain what it means.
- St. Louis County districts are marked with a `COUNTY` code of 096. What are the best and worst z-scores for St. Louis County districts?