Reading

- BPS Chapter 4.

Exercises

BPS - Check your skills Chapter 4 # 14-20. You do not need to turn these in.

BPS Chapter 4 # 2, 5 (by hand), 7, 8, 24, 25, 28, 39

Brain Size and Intelligence This problem uses the file `brain.csv`. The file contains data from a 1991 study of brain size and intelligence by Willerman et. al. For 40 volunteer subjects, they measured IQ using three variations of the Weschler IQ test, reporting the Full Scale, Verbal, and Performance scores. Brain size is given by a count of pixels from 18 MRI images per subjects. Subject height (inches) and weight (pounds) were also recorded.

1. Make a histogram of the full scale IQ variable. How would you describe this distribution? Can you guess an explanation for what you see?
2. (a) Make a scatter plot with a fit line between height and weight, using different markers for male and female subjects (give `plot` the option `pch=unclass(brain$gender)`.) What is the correlation between subject height and subject weight?
   (b) Make a scatter plot with a fit line between height and brain size, using different markers for male and female subjects. What is the correlation between subject height and brain size?
   (c) Make a scatter plot with a fit line between weight and brain size, using different markers for male and female subjects. What is the correlation between subject weight and brain size?
   (d) Would you choose height or weight as a better explanatory variable for brain size?
3. (a) Make a scatter plot with a fit line using brain size (`MRICount`) as the explanatory variable and Full Scale IQ as the response variable. Use different markers for male and female subjects. Print it.
   (b) Is there a positive association between these variables? How strong is the correlation?
   (c) Define a new variable which is the log of the MRI count and see if that improves the scatterplot and correlation.
   (d) What is the correlation between brain size and the other IQ scores: verbal and performance?
   (e) Maybe gender makes a difference. Compute the correlation between brain size and the three IQ scales for male individuals, and then for females.