

Homework Assignment 6
Psychology 2101
Fall, 2008

Use R whenever possible to solve the following problems. Investigate the R function `cor` by using the command `?cor` and examining the Help file. Note especially that you can specify a “`method`” with the `cor` command.

For all problems, you must (a) Show your R commands for setting up the problem, and (b) show the R output.

1. (40 Points) Consider the following data:

<i>X</i>	<i>Y</i>
5	2
3	5
6	6
19	9
8	7

- a) Compute the Spearman rank-order correlation between *X* and *Y*.
- b) Compute the Pearson product-moment correlation between *X* and *Y*.
- c) Compute the means and standard deviations for *X* and *Y*.

2) (40 points).

- a. Using the results from problem 1, compute by hand or with a calculator the slope and *Y*-intercept for predicting *Y* from *X* for the data in problem 1, using the formulas in the tutorial concept sheet for *b* and *c*, the slope and *Y*-intercept. **Show all work.**
- b. Verify that your formulas agree with those printed by the R “linear model” function `lm`.
- b. Using the result from part (a), compute predicted scores \hat{Y}_i and error scores E_i for each of the 5 *Y* observations.
- c. Use R to draw the scatter plot, and the regression line for predicting *Y* from *X*.

3) (20 points)

- a. Convert *X* and *Y* to *Z*-score form using R.
- b. Then use the `lm` function to compute the least squares regression formula for predicting Z_y from Z_x and verify that the slope and *Y* intercept of the regression line agree with the theoretical result given in the tutorial concept sheet.