

PSYC602 - Homework #2

1 Notes

1. Complete this homework as a .Rmd file and submit the knitted .html file via ELMS.
2. A GRADE WILL BE ASSIGNED FOR THIS PROJECT. In completing this assignment, you may consult any text or other written materials you wish. You may NOT discuss the project with anyone other than your instructor or class TAs until after the due-date given above.
3. You have only a single opportunity to complete this assignment. Late papers will be downgraded the equivalent of one letter grade.

2 Scenario

You have now taken your second assignment as a statistical consultant at your first place of employment following the attainment of that long-awaited and eagerly-sought goal, your PhD (about which you now have some serious reservations). Strangely enough, the second person who comes to you for advice also can tell you little else about what he has measured other than the fact that the variables are named y and X_1 , X_2 , X_3 , and were collected in the order in which they are listed below. The question he poses to you is something like “Can I say anything about y with any degree of confidence, given my knowledge of X_1 , X_2 , and X_3 ?”

3 Tasks

In your desire to answer such a question, you decide to:

1. State H_0 , both formally (in terms of population parameters) and in words
2. State H_1 , both formally (in terms of population parameters) and in words
3. Select an error rate
4. Perform a regression of the full model of these data using `lm()`, print the regression results using `summary()` and obtain standardized regression coefficients using `update()` and `scale()`.
5. Perform regressions on reasonable sub-models of these data using the same method described above
6. Write out both the raw-score and the standardized prediction equation in full
7. Produce time-series plots of y and e (that is, separately plot y and e vs. observation number) using `qplot()`
8. Create and print a data.frame with y , \hat{y} , and e for each observation
9. Use `cor()` to calculate the correlations among y , \hat{y} , and e , and use `print()` and `xtable()` to produce an html table of the correlations.

10. Use `ggpairs()` to display all pairwise scatter plots and correlations among y , \hat{y} , and e
11. Explain the intercorrelations found above
12. Interpret the results, in which you indicate the model you believe gave rise to the data

4 Data

These data are included as `hw2.csv` on ELMS

y	X1	X2	X3
10	1	2	1
27	2	4	3
29	3	3	3
29	4	2	1
38	5	4	2
29	6	3	1
45	7	3	3