# Psychology 6136: Two way tables tutorial

**NOTE**: For these tutorials, it is best if you do your work in an R script, say, tutorial-twoway.R that you can save. If you want to compile it to HTML as a notebook (File -> Compile report), you might want to begin with a header like

#' ---

#' title: "Two way tables tutorial"

#' author: "your name"

#' date: "27 Jan 2023"

#' ---

If you get severely stuck, see <twoway-solutions.R>

[DDAR Exercise 4.4 extended] The Hospital data in vcd gives a 3 × 3 table relating the length of stay (in years) of 132 long-term schizophrenic patients in two London mental hospitals with the frequency of visits by family and friends.

> data("Hospital", package="vcd")

> Hospital

Length of stay

Visit frequency 2-9 10-19 20+

Regular 43 16 3

Less than monthly 6 11 10

Never 9 18 16

1. Find the row proportions for this table, i.e., the proportions of patients with differing length of stay for each value of visit frequency. What do you see there that relates to the question of independence of the table variables?
2. Carry out a χ2 test for association between the two variables. What do you conclude?
3. Say you don’t trust the asymptotic *p*-value from the test because the sample size is relatively small. See help(chisq.test)for how to get a Monte Carlo simulated *p*-value. Do it.
4. Use MASS::loglm() to carry out the standard χ2 test [Hint: you can use ~ 1+2 for the model formula]
5. Use assocstats() to compute association statistics. How would you describe the strength of association here?
6. Both variables can be considered ordinal, so vcdExtra::CMHtest()may be useful here. Carry out that analysis. Do any of the tests lead to different conclusions?

1. Try one or more of the following other functions for visualizing two-way contingency tables with this data: plot(), tile(), mosaic(), and spineplot(). [For all except spineplot(), it is useful to include the argument shade=TRUE]. Give a simple description of the pattern of association between visits and length of stay.