1 R demonstration

- Download the R Users Guide from vUWS.
- The lab demonstrator will demonstrate the use of R based on the section "Using R in Chapter 6" of the R Users Guide.

  During this time, observe how the instructor is interacting with R and try out some of the code on your own computer.

2 Lab exercise

- Download the documentation of the `Lock5Data` package from the subject's vUWS site or from the CRAN archive at http://cran.r-project.org/web/packages/Lock5Data/Lock5Data.pdf.
- Read the description of the data set `SalaryGender` in the documentation of the `Lock5Data` package.
- Read the description of the data set `Wetsuits` in the documentation of the `Lock5Data` package.
- Write an R script that performs the following tasks:

  1. Load the data `SalaryGender` from the `Lock5Data` package.

  2. Use `prop.test` to compute a 95% confidence interval for the difference in the proportion of teachers that have a PhD between male college teachers and female college teachers.

  3. Confirm the result from part 2 by computing the confidence interval without using the function `prop.test`.

  4. Use `prop.test` to perform the following hypothesis test with a significance level of 1% on the proportion of teachers that have a PhD between male college teachers and female college teachers: $H_0 : p_M = p_F$, and $H_A : p_M > p_F$.

  5. Use `t.test` to compute a 90% confidence interval for the difference in the mean salary between male college teachers and female college teachers.

  6. Use `t.test` to perform the following hypothesis test with a significance level of 5% on the difference in mean salary between male college teachers and female college teachers: $H_0 : \mu_M = \mu_F$ and $H_A : \mu_M \neq \mu_F$.

  7. Load the data `Wetsuits` from the `Lock5Data` package.

  8. Use the function `t.test` to conduct a paired t-test with a significance level of 5% to test whether there is evidence for the claim that wearing a wetsuit results in a greater swimming velocity.

  9. Repeat the above analysis ignoring that the data is paired and using a two sample t-test instead.

  The whole script should run without errors. Make sure to save the script in your directory. Remember to add comments to your script as you go, so that you can still understand it later.

Workshop Exercise 8

- Download the Workshop Exercise task sheet and the R Markdown template from the unit's vUWS site.
- Answer all questions, editing the R Markdown file as required.
- Use R Studio to produce ("knit") a MS Word document from your R Markdown file. You may have to use the package manager in R Studio to install the packages `knitr` and `rmarkdown`.
- Use MS Word to convert the Word document to PDF.
- Submit your solution in PDF format on vUWS by clicking on the link **"Workshop Exercise 8"**.

  Do NOT use the link "Practice Workshop Exercise" to submit your solution!

  If you cannot knit your R Markdown file, start a text submission in vUWS and paste the content of your R Markdown file into the text entry field. Do not upload the R Markdown file.

  Submission closes at exactly 5 minutes to the hour, just before the end of your workshop.

Do you feel that you could do with some extra help understanding statistics? – If so, please make use of the free help offered by MESH and the PASS programme. Check out the *MESH* and *PASS* tabs on the unit's vUWS site for more information.