MATH 4773 Laboratory 9: Principles of Experimental Design

Learn the basic principles of Experimental design.

# Objectives

1. Learn the terminology
2. Learn how to control the information in an experiment
3. What are the Noise reducing methods
4. What are the volume increasing methods
5. How do you select the sample size
6. Why is randomization so important

### Tasks

All output should be made through RMD. The final document should be knitted into html.

* Task 1
  + Download from CANVAS the zipped data files, “Dataxls”
  + Unzip the contents into a directory on your desktop (call it LAB)
  + Download the file “Lab9.R”
  + Place this file with the others in LAB9.
  + Start Rstudio
  + Open “lab9.r” from within Rstudio (this is an exemplar file).
  + Using hash commenting and at the top of Lab 9 place the task number eg #Task 1
  + Go to the “session” menu within Rstudio and “set working directory” to where the source files are located.
  + Copy and paste the working directory by issuing the command getwd(): under #Task 1
* Task 2
  + Please read all of chapter 13
  + There are 7 sections
  + Give a paragraph description of each section to show that you have read and understood the material – type below:
  + 13.1
  + 13.2
  + 13.3
  + 13.4
  + 13.5
  + 13.6
  + 13.7
* Task 3
  + Using the EPOXY data set read and reproduce the analysis on pages 736 using R
  + Read and understand the STATISTICS inaction example completely pg 736
  + Omit the block (exposure) terms are omitted would there be evidence of a difference among treatment means? Show R analysis and the model you used.
* Task 4
  + Explain Example 13.6 page 733
  + Work through the calculations and show the formulae in Latex – make calculations in an R chunk:
  + Explain Example 13.7 page 734 – explain some deficiencies in how the replication “r” was calculated (see my R code on canvas)
  + Work through the calculations in an R chunk all formulae in Latex.