Electronics and
Computer Science

UNIVERSITY OF
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Technical Writing: Results

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What goes in this section?

Key Points:

Written and/or finalised FIRST before any other section!

Is the most important section as it contains all the raw evidence of your work.

Presents ALL the results/data obtained from your work – not just those that you choose to present.

You should DESCRIBE your results/data.

THIS IS YOUR EVIDENCE AND THE FIRST PART OF YOUR PROOF/JUSTIFICATION

What are results?

Results are experimental measurements, simulation or test outputs. This is your opportunity to present the output of your work and demonstrate your ability to run an experiment or test series.

The first demonstration from your work is not only the results but your ability to carry out the work – decide on parameter values, choose parameter sweeps to demonstrate behaviours in your data, etc.

You should presented ALL of your results. Do not pick and choose.

However, this is sometimes not possible due to volume of data. In this case, it is appropriate to place your data in an Appendix (which could be an attached CD). The results in the report should STILL be all of your data but what appears in the results section is then a representative sample or perhaps a cumulative representation of a lot of raw data.

What do you say?

Describe in detail the values of each experimental parameter for each set of results – do not miss any out or attempt to "make things simpler". For each set of data, all details necessary to repeat the experiment or test must be provided.

Presentation method:

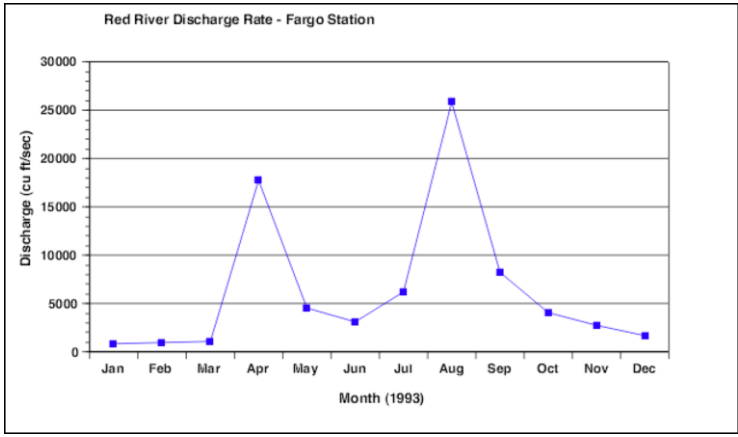
- Fixed parameters
- Varied parameters:
  - Range
  - Accuracy
  - Error
- Then present data recorded for this set of parameters
- Describe the features of the data
- Highlight important features
- Repeat.

How to present data

There are several methods and which is your choice is largely dependent on the best way to show your data. You should *design* your presentation to show what you want, with the corollary that you should not present it in an unnecessarily complicated way.

Tables:

- Used where data is sparse
- Used where data is not numerical
- Can present multiple parameter variations at once.



Representative graphs (line, pie and bar charts)

- Used for discrete numerical data or groupings
- Used for part numerical/part non-numerical data

Continuous Graphs (scatter plots)

- Used for continuous numerical data
- Best for showing variation of data against a varied parameter
- Can be two dimensional (one parameter against another) or three dimensional (one parameter against two others)

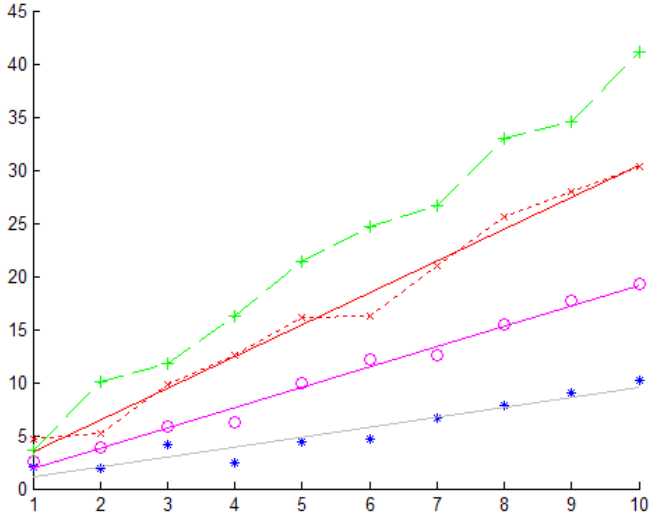
How to present data

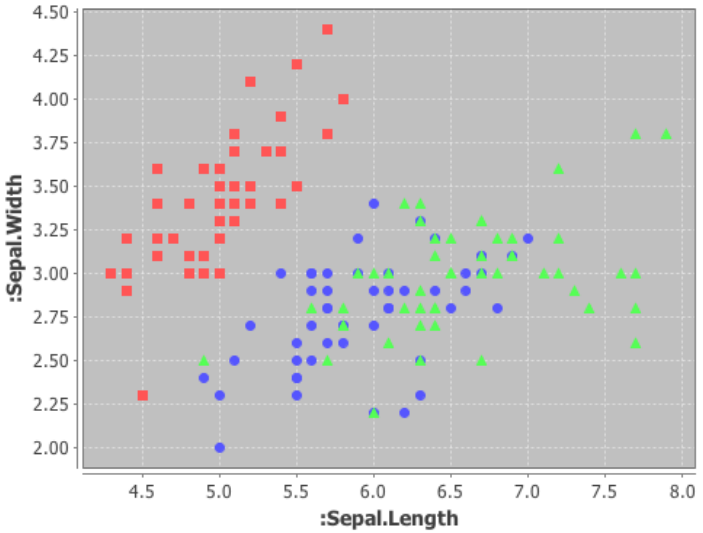
This neatly leads onto two issues:

First, adding lines to scatter plots – yes or no?

- Lines are appropriate when you have a set of data of an output or measurement that you want to present as a function of a varied experimental parameter. Your data is **more important** than the values of the parameter and you want to highlight the variation in your data, therefore your data goes on the y-axis and the parameter on the x-axis. Any variation is then observed instinctively as hills and valleys providing you with verbal analogies to describe your data.

- Lines are not appropriate for plotting two sets of measured values against each other for the purpose of examining data distributions. Neither of the two sets of values is more important than the other. This is not appropriate for examining multiple values where plotting a mean value and range is the correct one.

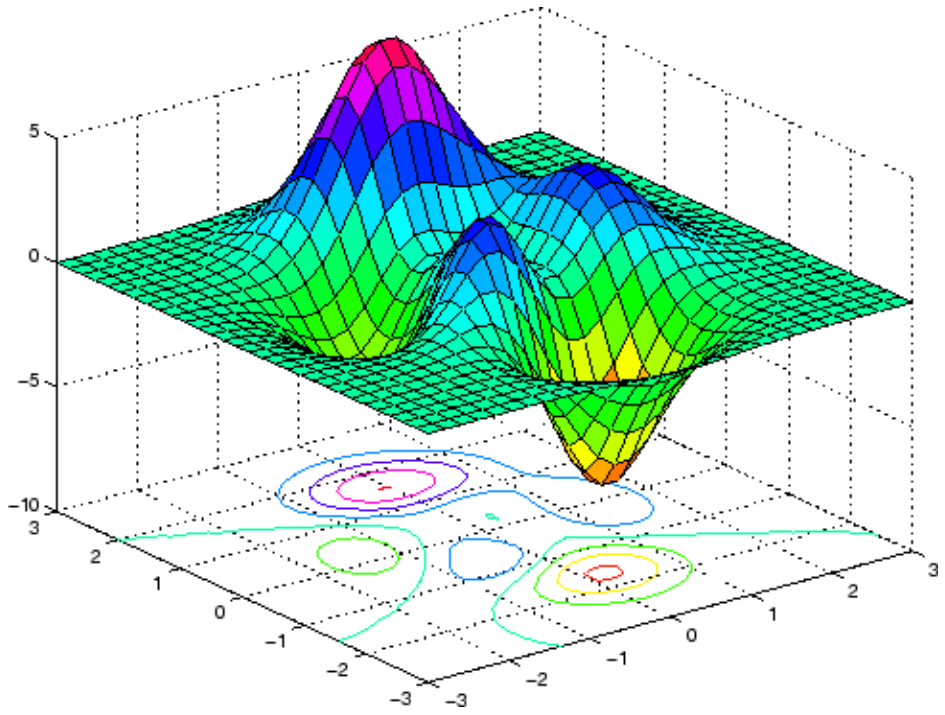




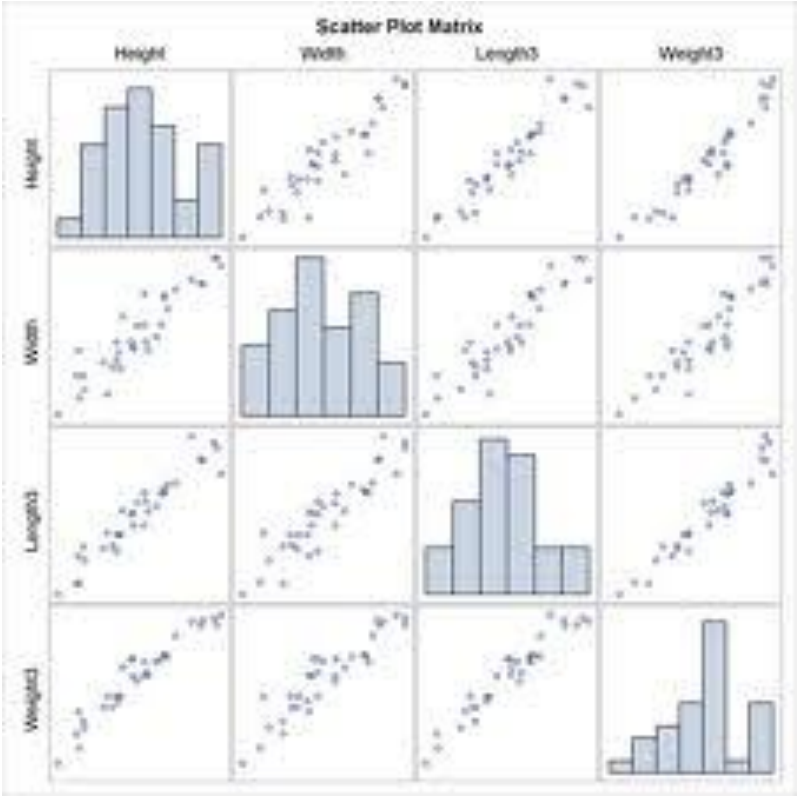
How to present data

The second issue is the general one of presenting multi-dimensional data. With complex data, it becomes an exercise in accessible visualisation.

Continuous data as a function of two varied parameters can be presented as contours or surfaces.



Multidimensional data is much more difficult to visualise.



How to describe

Keep your description concise. Try to highlight key features and any trends and behaviours – demonstrating your ability to understand and interpret. Discuss the variation of the results with parameters or input values. Relate variation or trends across all the presented data.

Relate variations to different devices or discuss variation, error and spread in cumulative data measurements. Do not ignore “null” areas – areas of no agreement – areas of noise or no correlation.

Describe influences of experimental setup variation or problems on results.

Describe the effect of any modification of the setup on your results – NOTE in a longer work, this would likely be a second results section.

Final notes on Results

WRITE THIS BIT FIRST.

THIS IS YOUR EVIDENCE AND THE FIRST PART OF YOUR PROOF/JUSTIFICATION

Keep your description concise. Try to highlight key features and any variations that you want to draw attention to.

Do not curve fit yet – this is analysis.