

DV1413 — ASSIGNMENT 2 (F/P/3/4/5): PUBLISHING RESULTS

Deadline 15 February 2012 23:55
Submission zip-file uploaded to itslearning

1 Description

In this assignment you will learn how to collect, process, present, interpret, and publish data to a scientific standard. The assignment is divided into parts:

1. collection of data sets from n repeated runs of a simulated experiment
2. processing these data sets into a **mean value**, and **measurement of uncertainty** for each data point
3. using *gnuplot* software to display these data points in charts, with **error bars**
4. using \LaTeX to type-set a formal document
5. including paragraph(s) of statistical analysis and discussion of graphs and figures
6. adding appropriate detail to captions
7. providing references to literature

The submitted .zip must contain the .pdf generated, .tex and .bib files used, and any images.

2 Grading

The grade that you receive is dependent on you demonstrating the following:

Grade 3:

- a data set is collected from any experiment and repeated, minimum 3 times ($n = 3$).
- data set is correctly processed into mean values
- a measurement of error (standard deviation or standard error) is calculated for each data point
- 2 different graphs are created using gnuplot
- at least 1 graph has error bars displayed

- \LaTeX is used to create a document
- graphs are included as **figures** in the document with **captions**
- a paragraph briefly describes the experiment
- a paragraph briefly explains the graphs
- up to 1 page of collected data is appended to the document
- up to 1 page of processed data is appended to the document

Grade 4:

- all points for grade 3 are met
- you must use data sets generated from an experiment that you design
- the model used in your experiment must be explained briefly but clearly
- an **equation** used either in statistical analysis or in the experiment model is provided and described in text
- a **table** is created using \LaTeX and provided in the document, containing some of the collected data
- a **supporting visualisation** is provided to help explain the experiment (e.g. a screen capture or diagram)
- a **reference** to a book or article is provided, and cited in the text
- all figures have axis labels with units, keys, suitable scales, and captions giving statistical methods used

Grade 5:

- all points for grade 4 are met
- a paragraph discusses if a trend can be established, with reference given to a figure
- discuss if points on a chart show significant difference, and explain why
- any data points with large error bars are discussed
- charts have a suitable number of data points, and are free of clutter
- a trend line plot is added to a chart, with the function provided
- discuss if further experiments are needed or not before conclusions can be made about trends in the data