MACM 316 – Guidelines for Computing Assignments

General Expectations. Computing assignments are designed for you to explore and develop a deeper understanding of concepts and numerical algorithms discussed in lectures. MACM 316 requires you to write and execute Matlab programs in order to see how algorithms are implemented in practice, but programming or software design is not its main focus. So these assignments concentrate more on running (and/or modifying) relatively short Matlab codes, observing their behaviour, and analysing the output both quantitatively and qualitatively.

The content of your written reports should not only explain the code you have written, but also demonstrate your understanding of why (or why not) it is useful/correct. In other words, I expect you to explain the main things you have done, state clearly what you have observed and learned, justify any changes or additions to the code, explain your parameter choices, etc.

Basic Format. Your computing assignment must be submitted as a single PDF file that is exactly 2 pages long. Page 1 is your written report and should contain all discussions, data and figures in a single sheet (headed by your name and ID number). Page 2 should contain a listing of your Matlab code, which I encourage you to annotate by highlighting any changes or additions that you have made, as well as any interesting code features (if appropriate). Any pages that exceed this 2-page limit will be ignored. Reports must be uploaded before the deadline using the Crowdmark link provided to you by your TA. Don't wait till the last minute!

Written Communication. The purpose of your written report is to communicate your results and your understanding of them to the marker. The quality of your communication necessarily reflects your level of understanding of the assignments. Consider your fellow students as your target audience – this is the level at which graders will be evaluating your work. *Focus on "the three C's":*

- *Clarity:* Organize your assignment around key ideas. Write in complete sentences. Produce clearly labelled tables/plots/graphics and explain the key features in them.

- *Conciseness:* The written part of your report is limited to one page, including all output, tables, plots and graphics. Streamline your presentation while aiming to clearly communicate your main ideas. Keep the discussion short and to-the-point.

- *Correctness:* Check your work carefully for mistakes. Does your data make intuitive sense? If you obtain odd or surprising results, are you sure they are correct or could there be a bug in your code? Are your conclusions logical? If you are in doubt, discuss the problem with your instructor, TAs or fellow students.

Collaboration. I encourage you to discuss problems with other students and the TAs – the Canvas "Computing Assignments" discussion groups are intended for this purpose. But your written submission must be your own work. You should acknowledge any collaborations with or contributions from the instructor, TAs, Canvas discussions, etc. If you make use of outside sources (books, web sites, . . .) then you should cite them and be sure to rephrase in your own words.

Graphical Presentation. All plots must be thoroughly labelled, including titles, axis labels, and legends (if appropriate), and must be large enough to read easily. Clearly identify important features in your figures by writing directly on your plots – don't leave it up to the reader to interpret the results for themselves. For each plot, be sure to clearly indicate what you have computed – be detailed enough that the reader can reproduce your results if needed. See page 2 for an example of what I mean by "good" and "bad" versions of the same plot.

**Grading Scheme.** Reports will be graded on a scale of zero to ten, roughly as follows:

10: Exemplary writing and presentation. Clear interpretation of computed results.

8: Good writing and presentation. Clear interpretation of computed results. Some small details are either missing or unclear.

6: Significant details are missing or incorrect. There is only evidence of an average learning outcome.

4: Major components are incorrect or incomplete. Below average evidence of learning outcomes.

2: Poorly communicated and/or incorrect results. Primary learning objectives have not been met.

0: Incomplete or plagiarized work.

BAD PLOT:

- no x,y-axis labels
- no title
- can't tell which line is which.

No y-axis scale

Too small Can't read →
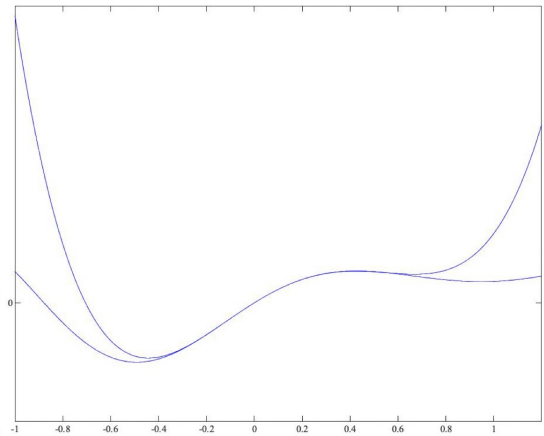
GOOD PLOT:

- larger fonts } easy to
- thicker lines } read
- title & axis labels
- lines are labelled AND use different colors
- extras: legend, points,...

Q4(a): Taylor approximation at x=0

function f(x)
Taylor poly $P_4(x)$

$y = P_4(x)$

Error ≈ 1.869

$y = f(x)$