1 Homework Guidelines

Every homework assignment must come with both your solution to the problem as well as a hard copy of your code. However, we will not read your code in detail, so write your solution as if we did not have access to your source code. That means that your solution must by itself convince us that your code works and that your answer is reliable. We will discuss formal convergence testing later on. However, codes can be checked by reproducing known results, demonstrating that conserved quantities are held constant, or other methods as appropriate for the problem.

In addition, your solution must contain enough information that another person could reproduce your results. For example, for problem 2.1, you should state the initial guess(es), your desired precision, the number of iterations required to obtain that desired precision, and the final result obtained.

In general, plots of your results are very useful for conveying the needed information in a small amount of space. For example, I would strongly recommend including a plot of precision vs. iteration number for problem 2.1, as it both helps with reproducing your results and demonstrates clear differences between the various methods.

If the assignment requests that you use a particular Numerical Recipes algorithm, you don’t need to include the NR recipe itself unless you have significantly modified it.

I would strongly recommend not treating the actual homework writeup as an afterthought. While attaining the correct result is important, it is also very important that your solution conveys the necessary information in a clear fashion. Explaining your methods, proving their reliability, and presenting your results are all crucial aspects of all research work and will take more time than you expect.

1.1 Limits of Precision in Codes

I would recommend that you review the section in Numerical Recipes on Error, Accuracy, and Stability (Section 1.3 in the 2nd edition). This will explain why you can’t attain 17+ significant digits of accuracy in problem 2.2 (or any other problem) with single or double precision numbers.

2 Presentation Guidelines

Every student will be asked to present two or more homework assignments over the course of the semester. This will require you to do the following:

- Briefly summarize the relevant equations.
- Briefly explain your overall numerical method.
- Explain in detail any specific adaptations or applications of the method needed for the specific problem and the challenges it presented.
- Summarize your numerical results by means of plots and/or tables generated from your numerical output. Make sure that the plots are clearly labeled and can be easily read/interpreted.

You will need to use PowerPoint or another suitable software package for your presentation. Make sure that the package can handle equations, plots, and tables.

I would strongly recommend testing out your talk in advance of the classroom presentation to make sure that the images project properly, as the colors may not come out like you would expect. In addition, practicing your talk in advance helps make sure that you can convey all of the main ideas in an appropriate amount of time.

I recommend copying your presentation onto a flash drive, so that it can be accessed as quickly as possible without having to log into various accounts on the computer (like gmail). For joint projects and presentations, be sure to use a single flash drive to minimize set-up time.

Finally, I’ll need a hard-copy version of your talk to hand in after your presentation.