Assignment 1: Evaluating a Journal Article

Math 164 - Scientific Computing
Spring Semester 2003
Due Date: Thursday, January 30, in class.
Prof. de Pillis

February 13, 2003

Learning to communicate ideas clearly in writing is extremely important in the mathematical sciences. Before you can write your own technical papers successfully, it is imperative that you learn to read the technical papers of others. In this assignment, you will follow specific guidelines to help you evaluate a technical paper of your choice involving a mathematical model.

Go to the library and find a journal article which describes the mathematical modeling and solution of a problem of interest to you. A good place to start is the UMAP (Undergraduate Mathematics and its Applications Project) journals, which contain various articles describing applied mathematical models. Some of the UMAP journals contain the winning solutions to the Mathematical Contest in Modeling (MCM) that is held every year, along with a commentary on the winning solution write-up. These commentaries in particular may be of great help. Other good sources are the SIAM journals. The SIAM Review contains a section on “Education” that is generally quite accessible. Sprague Library has these journals in their holdings.

Answer the following questions about the article you have chosen:

1. What is the question being asked?
2. What modeling approach is being used (dynamic, optimization, probabilistic, combination)?
3. How is the model formulated?
4. How is the problem solved (analysis, computation, verification)?
5. What is the answer to the original question?
6. Overall evaluation:
   • Is the article well written (clear, understandable, includes enough detail)?
   • Was the chosen model a good one (capturing salient features, numerically stable)?
   • How could the problem be extended in an interesting way?

Guidelines for this homework. You will be working in pre-assigned groups of two. Please put both names on the paper you turn in.

The paper should be in essay format. Write it as you would write a review article. At the same time, be sure that the above questions are answered clearly, and point out clearly where in your review the questions are being answered. For example, you may decide to use section headers or paragraph headers in bold-face to highlight the question being addressed.

Your write-up should be text-formatted (no handwritten homework papers, please). You may use any text-formatting program you like, however LaTeX is highly recommended.

Be prepared to present your paper in class. You may use just overhead transparencies, or you may use a combination of transparencies and writing at the white-board.

MOST IMPORTANT: If you are confused about any aspect of this assignment, or would like help, some hints, or guidance, then ask me (come to my office, call on the phone, use e-mail). I will be happy to help you out.