

Statistics 580

Statistical Computing I

Spring 2008

- Instructor:** Mervyn G. Marasinghe, 2304 Wilson, 4-7774, E-mail: mervyn@iastate.edu
- Campus Office:** 209 Atanasoff, 4-0222,
- Class Hours:** TR 9:30–10:50 am, Howe 1220
- Office Hours:** 11:00–12:00 a.m. MWF, 209 Atansoff or by appointment in Wilson
- Required Background:** Statistics 579, 542, R language and some knowledge of the C programming language
- Recommended Texts:** These are available on reserve in the Snedecor Reading Room
- Elements of Statistical Computing by Ronald Thisted(1988)
Numerical Linear Algebra for Applications in Statistics by James E. Gentle(1998)
Numerical Methods of Statistics by John F. Monahan(2001)
Numerical Analysis for Statisticians by Kenneth Lange(1999)
C Programming Language (2nd Edition) by Kernighan and Ritchie(1988).
- Class Notes:** Typed supplementary notes for parts of the course will be available through the Stat580 homepage as pdf documents. Much of this material have been prepared using the texts referenced and may overlap with or identical to the material used in class. Copies of some overhead material may also be handed out or placed in the reference file. I have some extremely useful WWW links available on the Stat580 homepage on a variety of topics of interest. You could find others.
- Grading:** Standard A-F grading with +/- . Grades based on points earned from homework assignments, projects and a written final exam. 5 or 6 assignments and at least 1 or 2 projects are planned. No incompletes will be given; only material turned in by due dates will be graded except when extensions are permitted on an individual basis.
- Assignments: (40 points each) are due approximately 7-10 days after distribution. These will consist mostly of applying and exploring the concepts learned in class. Parts of the homeworks may involve theoretical derivations. You will need to turn-in a hard copy of your answer script. In addition, any programs needed should be e-mailed to me, and should be annotated appropriately. I would expect individual work to be submitted; however, active discussion and interaction among students is encouraged when working on these problems.
- Projects: (100 points each) will be given extra time when possible. These will be considered as strictly individual efforts; no interaction allowed whatsoever except with me. You will be on your honor to do your own work on the projects.
- Final Exam: (100 points) will be a closed book comprehensive written exam consisting of questions with short answers covering material presented in class. You will not be required to write program code.

Computing:

This course is necessarily computer intensive. We will use R under Linux. You may not use Splus in place of R in this class. You will also be required to write some C programs. I will provide some instruction on how to write C programs if needed. We will explore some generally available subroutine libraries such as GSL as well as routines and functions obtained from texts and other sources.

Linux is a free Unix-type operating system developed under the GNU General Public License (GPL), the source code for Linux is freely available to everyone. Like Unix, Linux provides flexibility and ease of use that is very suitable for scientific computing. Iowa State University has site licenses for the Redhat Enterprise Linux operating system. The department has installed several Linux servers that you are able to remotely connect to open X sessions via X-win32. You will be taught how to use Linux in the department lab using this facility.

If you are a new R user, it is recommended that you have access to a book/manuals or online introductions to R.

Class Schedule:

A schedule of topics to be presented is similar to those given in the course outline available through this homepage. I will attempt to cover most of the material listed there. If you are taking this class for credit you are urged to attend all classes including the special lab classes I will schedule at the beginning.