

Biostatistics 615/815
Statistical Computing

Instructor: Goncalo Abecasis

Text:

Algorithms in C, by Robert Sedgewick (1998)

Numerical Recipes in C, by Press et al (1992)

Additional Requirement for 815: The 815 section of this course

requires completion of a group research project developing an implementation of these algorithms to solve a particular public health or biostatistical problem.

Lecture 01 -- Connectivity
Lecture 02 -- Compilers, Debuggers and Profilers
Lecture 03 -- Programming in C
Lecture 04 -- Programming in R
Lecture 05 -- Computer Graphics in R
Lecture 06 -- Algorithm Analysis
Lecture 07 -- Recursive Functions
Lecture 08 -- Dynamic Programming
Lecture 09 -- Elementary Sorting
Lecture 10 -- Shellsort
Lecture 11 -- Quick Sort
Lecture 12 -- Mergesort
Lecture 13 -- Stacks and Queues
Lecture 14 -- Hashing
Lecture 15 -- Revision
Lecture 16 -- Mid-Term Assessment
Lecture 17 -- Generation of Random Numbers
Lecture 18 -- Numerical Optimization
Lecture 19 -- Optimization With Parabolas
Lecture 20 -- Mixture Distributions
Lecture 21 -- The Nelder-Mead Simplex Method
Lecture 22 -- The E-M Algorithm
Lecture 23 -- Simulated Annealing
Lecture 24 -- Gibbs Sampler
Lecture 25 -- Numerical Integration
Lecture 26 -- Revision
Lecture 27 -- Final Examination