MATH 680 - ASSIGNMENT 1

To be handed in not later than 5pm, Wednesday 20th October 2010.
Projects handed in late will be subject to penalization of up to 100% marks
Please hand in during lectures, to Burnside 1225, or to the Mathematics Office Burnside 1005

The attached paper describes algorithms for fitting penalized linear regression models:

Coordinate descent algorithms for lasso penalized regression, by Tong Tong Wu and Kenneth Lange, *Annals of Applied Statistics*, **2**(1), 2008, 224-244.

After forming teams of **no more than three people**, write a project addressing the following issues:

(a) Produce code in a suitable computer language that can reproduce a simulation study similar to that Section 7 of the paper. Demonstrate the use of your code in a simulation study of your own design.

80 %

(b) Describe how you would extend your code to deal with penalized **generalized** linear model fitting.

20 %

BONUS MARKS: Find a real data set to which the algorithms described in (a) or (b), and use your code to analyze it, reporting the nature of the data, where you sourced it, and what results you obtain.

UP TO 20 %

Presentation details:

- Limit your project to a **maximum** of 16 pages including title page and tables.
- Your project **must be typewritten** in Latex or Word. Format must be
  - 11pt font or greater
  - Pages $8\frac{1}{2}$" x 11" (216mm x 279mm) (Letter size)
  - Margins at a minimum of $\frac{3}{4}$" (18.7 mm)
  - No narrower than single-spaced, with no more than six lines of type per inch.

  A Latex template meeting these requirements is available on request.
- Marks will be deducted for poor presentation.
- Include, on a separate page, the details of the contributions made by each member of your team.