

# Lab Assignment - 1

Instructor: Dr. Arabin Kumar Dey

## 1 Due date:

- 14/8/2014.

## 2 Notes:

- Submit the codes in all R / S-plus corresponding to the questions.
- Make a proper documentation preferably in latex or using some other software and submit the printout of the report in .pdf form.
- Each student needs to write his/ her own solutions, even though discussions of the assignments between students are encouraged.

## 3 Assignments:

Consider the daily stock return of the Citigroup (tick symbol C) and the Standard and Poor's 500 Composite index from January 2001 to December 2008. The data are simple returns and in the file d-csp0108.txt (three columns with date, C-rtn, SP-rtn).

(a) Make scatterplots and histograms of C-rtn and SP-rtn. Superimpose the density of normal distributions with sample mean and sample variance as its parameters, over the histograms of C-rtn and SP-rtn data.

(a) Now use your intuition or play trial and error method to fit the same data sets with some t-distribution, double-exponential, cauchy as well as a mixture of two normal distributions on the same graph. Which one is coming best ? What is your comment on the tail of cauchy distribution (You may illustrate the answer after finishing part (b) and part (c) too).

(b) Make different qqplots taking quantiles for each density you have chosen against the empirical quantiles of the data. Give proper interpretation.

(c) Plot the empirical survival curve and superimpose survival curves for all the densities you have chosen to fit the data. Comment on the picture.

**Extra :** If you find the task really interesting; Play a little more with mixture of two cauchy distributions too.