STAT 8003, Homework 1

Group # ... (Replace this)
Members: ... (Replace this)

Sep. 5, 2013

This homework is due Thu., 2013/09/13, 12:00p.

Instructions: Use this LaTeX file as a template for your homework solution. Generate a PDF file from it and submit the PDF file to blackboard. Please name your file as

hw01-groupnumber.pdf

For example, if you are in group 1, name your file as hw01-1.pdf.

You can discuss the homework with each other in general terms, but you need to be able to write the solutions by yourself. You can also search online for solutions.

Problem 1. (30 points, 10 for each sub-problem)

Please use LaTeX to input the following math equations.

a).

$$\begin{aligned} f(y \mid \psi) &= \prod_{i=1}^{n} \rho_{ij} \\ &= \prod_{i=1}^{n} \frac{\exp[u_{ij}(x_i, z_j)]}{\sum_{l=1}^{p} \exp[u_{ij}(x_i, z_l)]}. \end{aligned}$$

b).

$$\begin{aligned} \mathbf{V} &= \int_0^1 \int_0^{\sqrt{1-x^2}} 2x^3 y \, \mathrm{d}y \, \mathrm{d}x \\ &= \int_0^1 x^3 y^2 \Big|_{y=0}^{y=\sqrt{1-x^2}} \, \mathrm{d}x. \end{aligned}$$

c).

$$\begin{pmatrix} \mathbf{\Omega}' & \frac{1}{2}\mathbf{C}' \\ \mathbf{C} & \mathbf{0} \end{pmatrix} \begin{pmatrix} \mathbf{x} \\ \boldsymbol{\lambda} \end{pmatrix} = \begin{pmatrix} \boldsymbol{\omega} \\ \mathbf{0} \end{pmatrix}$$

Problem 2. (10 points) Let $X = 0,\ 0.01,\ \ldots,\ 2$, and let $Y = sin(X)$. Plot Y *vs.*. X in R. The x-axis should correspond to variable X and the y-axis should correspond to variable Y. Please put the figure here, and caption it as "A figure to show relationship between X and Y".