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STAT 8003, Homework 1

Group #8

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Sep. 12, 2013

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

Please use LaTeX to input the following math equations.

a).

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

b).

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

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 the variable X and the y-axis should correspond to the variable Y. Please put the figure here, and caption it as "A figure to show relationship between X and Y".
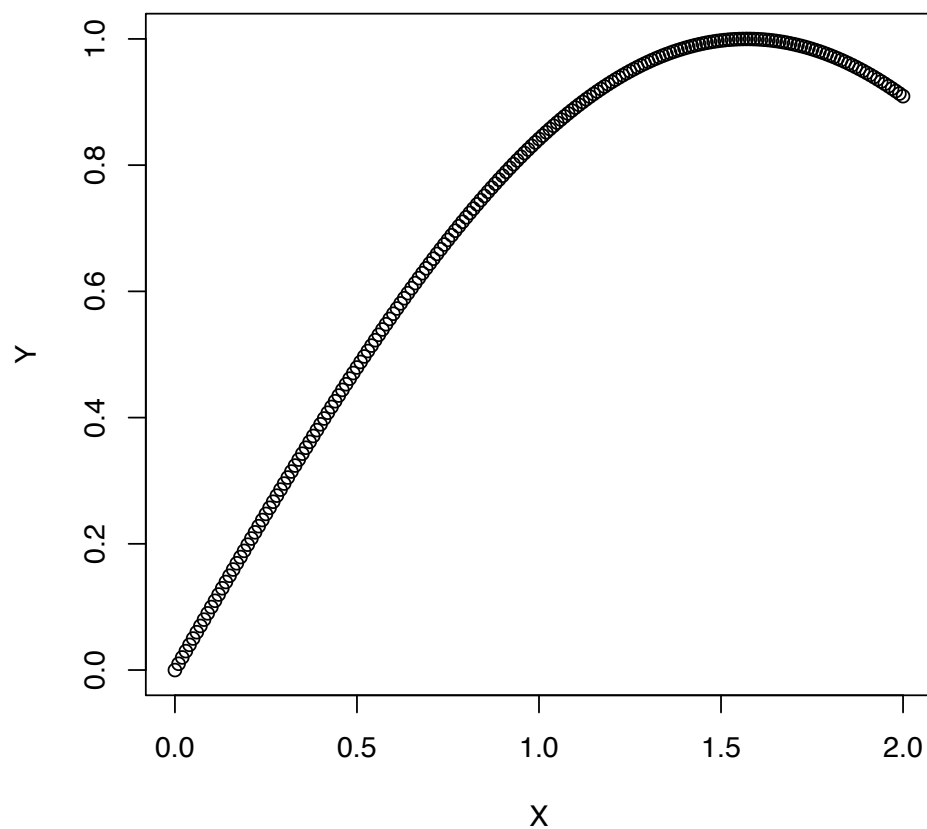

Figure 1: A figure to show relationship between X and Y