smfprob7.tex

SMF PROBLEMS 7. 30.5.2012

Q1. Show that the regression (= least-squares) line for the data $(x_1, y_1), \ldots, (x_n, y_n)$ is

$$y - \overline{y} = r_{xy} \frac{s_y}{s_x}(x - \overline{x}),$$

with $r = r_{xy}$ the sample correlation coefficient, s_x, s_y the sample standard deviations.

Q2. With data y and two predictor variables (regressors) u and v, show that the regression (= least-squares) plane is $y - \overline{y} = a(u - \overline{u}) + b(v - \overline{v})$, where a, b satisfy

$$\begin{aligned} a s_{uu} + b s_{uv} &= s_{yu}, \\ a s_{uv} + b s_{vv} &= s_{yv}. \end{aligned}$$

NHB