QUANTITATIVE METHODS
Martin Huard
Winter 2005

Formula Sheet

$$\overline{x} = \frac{\sum x}{n} \qquad \mu = \frac{\sum x}{N} \qquad \overline{x} = \frac{\sum xf}{n}$$

$$s^2 = \frac{\sum (x-\overline{x})^2}{n-1} = \frac{SS_x}{n-1} = \frac{\sum x^2 - \frac{\left(\sum x\right)^2}{n}}{n-1}$$

$$\sigma^2 = \frac{\sum (x-\mu)^2}{N} = \frac{\sum x^2 - \frac{\left(\sum x\right)^2}{N}}{N}$$

$$s^2 = \frac{\sum (x-\overline{x})^2 f}{n-1} = \frac{\sum x^2 f - \frac{\left(\sum xf\right)^2}{n}}{n-1}$$

$$CV = \frac{s}{\overline{x}} \qquad CV = \frac{\sigma}{\mu}$$

$$y = a + bx$$

$$b = \frac{SS_{xy}}{SS_x} \qquad a = \overline{y} - b\overline{x}$$

$$SS_{xy} = \sum xy - \frac{\left(\sum x\right)\left(\sum y\right)}{n} \qquad SS_x = \sum x^2 - \frac{\left(\sum x\right)^2}{n}$$

$$r = \frac{SS_{xy}}{\sqrt{SS_x SS_y}}$$

$$\mu = \sum xp(x) \qquad \sigma^2 = \sum (x-\mu)^2 p(x) = \sum x^2 p(x) - \mu^2$$

$$z = \frac{x-\mu}{\sigma} \qquad \mu_{\overline{x}} = \mu \qquad \sigma_{\overline{x}} = \frac{\sigma}{\sqrt{n}}$$

$$z = \frac{\overline{x}-\mu}{\frac{s}{\sqrt{n}}} \qquad t = \frac{\overline{x}-\mu}{\frac{s}{\sqrt{n}}} \quad df = n-1 \qquad z = \frac{\hat{p}-p}{\sqrt{\frac{p(1-p)}{n}}}$$

$$E = z_c \frac{s}{\sqrt{n}} \qquad E = t_c \frac{s}{\sqrt{n}} \qquad E = z_c\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$

$$\overline{x} - E < \mu < \overline{x} + E \qquad \hat{p} - E < p < \hat{p} + E$$

$$n = \left(\frac{z_c\sigma}{E}\right)^2 \qquad n = \frac{z_c^2 p^*\left(1-p^*\right)}{E^2} \qquad n = \frac{z_c^2}{4E^2}$$

$$\chi^2 = \sum \frac{(O-E)^2}{E} \qquad E = \frac{(\text{row total})\times(\text{column total})}{\text{grand total}} \qquad df = (R-1)(C-1)$$