Formulas

$$\bar{x} = \frac{\sum x}{n}$$

$$s = \sqrt{\frac{\sum (x-\bar{x})^2}{n-1}}$$

$$s = \sqrt{\frac{\sum x^2 - \frac{(\sum x)^2}{n}}{n-1}}$$

$$\mu_{\bar{x}} = \mu$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$$

$$z = \frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$$

$$t = \frac{\bar{x}-\mu}{s/\sqrt{n}}$$

$$(\bar{x} - z_{\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}, \bar{x} + z_{\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}})$$

$$(\bar{x} - t_{\frac{\alpha}{2}} \frac{s}{\sqrt{n}}, \bar{x} + t_{\frac{\alpha}{2}} \frac{s}{\sqrt{n}})$$

$$E = z_{\frac{\alpha}{2}} * \frac{\sigma}{\sqrt{n}}$$

$$n = (\frac{z_{\frac{\alpha}{2}} * \sigma}{E})^2$$

$$t_o = \frac{\bar{x_1} - \bar{x_2}}{s_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$t_\alpha \ df = n_1 + n_2 - 2$$

$$s_p = \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}}$$

$$(\bar{x_1} - \bar{x_2}) \pm t_{\frac{\alpha}{2}} * s_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}$$

$$\hat{p} = \frac{x}{n}$$

$$z = \frac{\hat{p_1} - \hat{p_2}}{\sqrt{\hat{p_p}(1-\hat{p_p})}\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$\hat{p_p} = \frac{x_1+x_2}{n_1+n_2}$$

$$(\hat{p_1} - \hat{p_2}) \pm z_{\frac{\alpha}{2}} * \sqrt{\frac{\hat{p_1}(1-\hat{p_1})}{n_1} + \frac{\hat{p_2}(1-\hat{p_2})}{n_2}}$$

$$\chi_o^2 = \Sigma \frac{(O-E)^2}{E}$$

$$E = \frac{RC}{n}$$

$$\chi_\alpha^2 \ df = (r-1)(c-1)$$

$$MSTR = \frac{SSTR}{k-1}$$

$$SSTR = n_1(\bar{x_1} - \bar{x})^2 + n_2(\bar{x_2} - \bar{x})^2 + ... + n_k(\bar{x_k} - \bar{x})^2$$

$$MSE = \frac{SSE}{n-k}$$

$$SSE = (n_1-1)s_1^2 + (n_2-1)s_2^2 + ... + (n_k-1)s_k^2$$

$$F = \frac{MSTR}{MSE}$$

$$SST = \Sigma(x - \bar{x})^2$$

$$SST = SSE + SSTR$$