

Quiz 1 Formula Sheet - Important Formulas for Statistical Inference

One Sample

$$H_0 : \mu = \mu_0 \quad z = \frac{\bar{x} - \mu_0}{\sigma / \sqrt{n}}$$

$$t = \frac{\bar{x} - \mu_0}{s / \sqrt{n}}$$

$$H_0 : p = p_0 \quad z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0 q_0}{n}}}$$

$$n = \frac{(z_{\alpha/2} + z_{\beta})^2 \sigma^2}{\Delta^2}$$

$$n = \left[\frac{z_{\alpha/2} \sqrt{p_0 q_0} + z_{\beta} \sqrt{p_a q_a}}{\Delta} \right]^2$$

Two Samples

$$H_0 : \mu_1 - \mu_2 = \mu_0 \quad z = \frac{(\bar{x}_1 - \bar{x}_2) - \mu_0}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - \mu_0}{\sqrt{\frac{s_p^2}{n_1} + \frac{s_p^2}{n_2}}}$$

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

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - \mu_0}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$n = \frac{\left(z_{\alpha/2} + z_{\beta} \right)^2 (\sigma_1^2 + \sigma_2^2)}{\Delta^2}$$

$$H_0 : \mu_d = \mu_{d_0} \quad t = \frac{\bar{d} - \mu_{d_0}}{s_d / \sqrt{n}}$$

$$H_0 : p_1 - p_2 = 0 \quad z = \frac{(\hat{p}_1 - \hat{p}_2) - 0}{\sqrt{\frac{\bar{p}\bar{q}}{n_1} + \frac{\bar{p}\bar{q}}{n_2}}}$$

$$n = \frac{\left[z_{\alpha/2} \sqrt{2\bar{p}\bar{q}} + z_{\beta} \sqrt{p_1 q_1 + p_2 q_2} \right]^2}{\Delta^2}$$