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$$S = \sqrt{S^2} = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(X_i - \bar{X})^2}$$

$$\mathrm{Var}(\bar{X}) = \frac{\sigma^2}{n}$$

$$\mathrm{SE}(\bar{x}) = \frac{s}{\sqrt{n}}$$

$$\frac{T_n - \mathrm{E}(T)}{\sqrt{\mathrm{Var}(T_n)}} \underset{D}{\rightarrow} Z \sim N(0,\, 1)$$

$$b(T) = \mathrm{E}(T) - \theta$$

$$P(a \leq \theta \leq b) = 1 - \alpha$$

$$t = \frac{Y}{\sqrt{\frac{1}{n}\sum_{i=1}^{n} Z_i^2}} \sim t(n)$$

$$P(|\bar{x} - \mu| \leq d) = 1 - \alpha$$

$$P\left(\bar{x} - t_{\alpha/2,\, n-1}\frac{s}{\sqrt{n}} \leq \mu \leq \bar{x} + t_{\alpha/2,\, n-1}\frac{s}{\sqrt{n}}\right) = 1 - \alpha$$

$$t = \frac{\bar{X}_A - \bar{X}_B}{S\sqrt{\frac{1}{n_A} + \frac{1}{n_B}}} \sim t(n_A + n_B - 2)$$

$$S^2 = \frac{(n_A - 1)S_A^2 + (n_B - 1)S_B^2}{n_A + n_B - 2}$$

$$t = \frac{\bar{X}_A - \bar{X}_B}{\sqrt{\frac{S_A^2}{n_A} + \frac{S_B^2}{n_B}}} \sim t(df)$$

$$\frac{1}{df} = \frac{c^2}{n_A - 1} + \frac{(1-c)^2}{n_B - 1},\ \ c = \frac{\frac{S_A^2}{n_A}}{\frac{S_A^2}{n_A} + \frac{S_B^2}{n_B}}$$

$$\bar{X}_A - \bar{X}_B \pm t_{\alpha/2,\, df}\mathrm{SE}(\bar{X}_A - \bar{X}_B)$$

$$t = \frac{\bar{d}}{S_d/\sqrt{n}} \sim t(n-1)$$

$$t = \frac{\bar{X} - \mu_0}{S/\sqrt{n}} \sim t(n-1)$$

$$Z = \frac{p_A - p_B}{\sqrt{p(1-p)(\frac{1}{n_A} + \frac{1}{n_B})}} \to W \sim N(0,\, 1)$$

$$p = \frac{n_A p_A + n_B p_B}{n_A + n_B}$$

$$Z = \frac{p - \theta_0}{\sqrt{\theta_0(1-\theta_0)/n}} \sim N(0,\, 1),$$

$$\text{kun } \min\{n\theta_0,\, n(1-\theta_0)\} \geq 10$$

$$\mathrm{SE}(p) = \sqrt{\frac{p(1-p)}{n}}$$

$$p \pm z_{\alpha/2}\mathrm{SE}(p)$$

$$\mathrm{SE}(p_A - p_B) = \sqrt{\frac{p_A(1-p_A)}{n_A} + \frac{p_B(1-p_B)}{n_B}}$$

$$(p_A - p_B) \pm z_{\alpha/2}\mathrm{SE}(p_A - p_B)$$

$$e_{ij} = \frac{f_{i\cdot}f_{\cdot j}}{n},\; z_{ij} = \frac{f_{ij} - e_{ij}}{\sqrt{e_{ij}}}$$

$$\chi^2 = \sum_{i=1}^{r}\sum_{j=1}^{c} \frac{(f_{ij} - e_{ij})^2}{e_{ij}} \sim \chi^2((r-1)(c-1))$$

$$r = \frac{\frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{s_x s_y}$$

$$T = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} \sim t(n-2)$$

$$r_c = \frac{t_{\alpha/2,\,n-2}}{\sqrt{n - 2 + t^2_{\alpha/2,\,n-2}}}$$

$$P \approx 2\left[1 - \Phi\left(\frac{|s - \frac{n}{2}|}{\sqrt{n}/2}\right)\right]$$

$$U = n_A n_B + \frac{n_A(n_A+1)}{2} - R_A$$

$$Z = \frac{U - \frac{n_A n_B}{2}}{\sqrt{\frac{n_A n_B (n_A + n_B + 1)}{12}}} \to W \sim N(0,\, 1)$$

$$H = \frac{12}{N(N+1)}\sum_{i=1}^{I}\frac{R_i^2}{n_i} - 3(N+1) \;\sim \chi^2(I-1)$$

$$Y = a + bX + \epsilon$$

$$SS_E = \sum_{i=1}^{n} \epsilon_i^2 = \sum_{i=1}^{n} [y_i - (a + bx_i)]^2$$

$$b = \frac{\sum_{i=1}^{n}(x_i - \bar{x})y_i}{\sum_{i=1}^{n}(x_i - \bar{x})^2},\ b = \frac{s_{xy}}{s_x^2} = r\frac{s_y}{s_x}$$

$$a = \bar{y} - b\bar{x}$$

$$\hat{\sigma}^2 = \frac{SS_E}{n-2}$$

$$\mathrm{Var}(b) = \frac{\sigma^2}{\sum_{i=1}^{n}(x_i - \bar{x})^2}$$

$$b \pm \mathrm{SE}(b) t_{\alpha/2,\, df_E},\ \mathrm{SE}(b) = \sqrt{\mathrm{Var}(b)}$$

$$SS_T = SS_{REG} + SS_E,\ SS_T = \sum_{i=1}^{n}(y_i - \bar{y})^2$$

$$SS_{REG} = \sum_{i=1}^{n}(a + bx_i - \bar{y})^2$$

$$SS_E = \sum_{i=1}^{n}(y_i - a - bx_i)^2$$

$$df_T = n - 1,\ df_{REG} = 1,\ df_E = n - 2$$

$$r^2 = \frac{SS_{REG}}{SS_T} = 1 - \frac{SS_E}{SS_T}$$

$$F = \frac{SS_{REG}/df_{REG}}{SS_E/df_E} = \frac{SS_{REG}}{SS_E/df_E} \sim F(1,\, n-2)$$

$$T = \frac{b}{\mathrm{SE}(b)} \sim t(n-2)$$

$$F_r = (n-2)\frac{r^2}{1-r^2} \sim F(1,\, n-2)$$

$$a + bx_0 \ \pm\ t_{\alpha/2,\, df_E}\, \hat{\sigma}\sqrt{1 + \frac{1}{n} + \frac{(x_0 - \bar{x})^2}{\sum_{i=1}^{n}(x_i - \bar{x})^2}}$$

$$y_{ij} = \mu + \alpha_i + \epsilon_{ij}$$

$$SS_T = SS_{TR} + SS_E$$

$$SS_T = \sum_{i=1}^{k} \sum_{j=1}^{n} (y_{ij} - \bar{y})^2$$

$$SS_{TR} = n \sum_{i=1}^{k} (\bar{y}_i - \bar{y})^2$$

$$SS_E = \sum_{i=1}^{k} \sum_{j=1}^{n} (y_{ij} - \bar{y}_i)^2$$

$$df_T = N - 1,\ df_{TR} = k - 1,\ df_E = N - k$$

$$F = \frac{MS_{TR}}{MS_E} = \frac{SS_{TR}/df_{TR}}{SS_E/df_E} =$$

$$= \frac{N-k}{k-1} \cdot \frac{n \sum_{i=1}^{k} (\bar{y}_i - \bar{y})^2}{\sum_{i=1}^{k} \sum_{j=1}^{n} (y_{ij} - \bar{y}_i)^2} \sim F(df_{TR},\, df_E)$$

$$W = Q_{\alpha,\, k,\, df_E} \sqrt{MS_E/n},\ n = 2/(1/n_i + 1/n_j)$$

$$W = Q_{\alpha,\, k,\, \infty} \sqrt{\frac{n^2 k (nk+1)}{12}}$$

$$P(B_i|A) = \frac{P(B_i)P(A|B_i)}{P(A)} = \frac{P(B_i)P(A|B_i)}{\sum_{j=1}^{k} P(B_j)P(A|B_j)}$$

$$p(\Theta|X) = \frac{p(\Theta)p(X|\Theta)}{p(X)} = \frac{p(\Theta)p(X|\Theta)}{\int_\Theta p(\Theta)p(X|\Theta)\ d\Theta}$$