Formulário de Estatística

Cap. 4

$F_X(X_{(i)}) \sim \text{Beta}(i, n-i+1)$

$D_n = \sup_{x\in\mathbb{R}} |F_n(x,\underline{X}) - F_0(x)| = \max\{D_n^+, D_n^-\}$

$D_n^+ = \max_{1\le i\le n}\left\{\frac{i}{n} - F_0\left(X_{(i)}\right), 0\right\}$

$D_n^- = \max_{1\le i\le n}\left\{F_0\left(X_{(i)}\right) - \frac{i-1}{n}, 0\right\}$

$\sum_{i=1}^{k}\frac{(N_i-E_i)^2}{E_i} \overset{a}{\sim}_{H_0} \chi^2_{(k-\beta-1)}$

$\sum_{i=1}^k \frac{(N_i-n/k)^2}{n/k} = \frac{k}{n}\sum_{i=1}^k N_i^2 - n$

Cap. 5

$f_{\underline{X}|\underline{\theta}}(\underline{x}) = g[\underline{T}(\underline{x}), \underline{\theta}] \times h(\underline{x})$

$f_{X|\underline{\theta}}(x) = c(\underline{\theta}) \times \exp\left[\sum_{j=1}^k w_j(\underline{\theta})\, T_j(x)\right] \times b(x)$; $\left(\sum_{i=1}^n T_1(X_i), \ldots, \sum_{i=1}^n T_k(X_i)\right)$

$\frac{\bar{X}-\mu}{\frac{\sigma}{\sqrt{n}}} \sim N(0,1)$

$\frac{\bar{X}-\mu}{\frac{S}{\sqrt{n}}} \sim t_{(n-1)}$

$S^2 = \frac{1}{n-1}\left[\left(\sum_{i=1}^n X_i^2\right) - n(\bar{X})^2\right]$

$\frac{\bar{X}-\mu}{\frac{S}{\sqrt{n}}} \overset{a}{\sim} N(0,1)$

$\frac{(\bar{X}_1-\bar{X}_2)-(\mu_1-\mu_2)}{\sqrt{\frac{\sigma_1^2}{n_1}+\frac{\sigma_2^2}{n_2}}} \sim N(0,1)$

$\frac{(\bar{X}_1-\bar{X}_2)-(\mu_1-\mu_2)}{\sqrt{\frac{(n_1-1)S_1^2+(n_2-1)S_2^2}{n_1+n_2-2}\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}} \sim t_{(n_1+n_2-2)}$

$\frac{(\bar{X}_1-\bar{X}_2)-(\mu_1-\mu_2)}{\sqrt{\frac{S_1^2}{n_1}+\frac{S_2^2}{n_2}}} \overset{a}{\sim} N(0,1)$

$\frac{(n-1)S^2}{\sigma^2} \sim \chi^2_{(n-1)}$

$\frac{1}{\Delta} \times \frac{S_1^2}{S_2^2} \sim F_{(n_1-1,n_2-1)}$, onde $\Delta = \frac{\sigma_1^2}{\sigma_2^2}$

$F^{-1}_{F_{(n;\,m)}}(p) = \frac{1}{F^{-1}_{F_{(m;\,n)}}(1-p)}$

$\frac{\bar{X}-p}{\sqrt{\frac{p(1-p)}{n}}} \overset{a}{\sim} N(0,1)$

$\frac{\bar{X}-p}{\sqrt{\frac{\bar{X}(1-\bar{X})}{n}}} \overset{a}{\sim} N(0,1)$

$\frac{(\bar{X}_A-\bar{X}_B)-(p_A-p_B)}{\sqrt{\frac{\bar{X}_A(1-\bar{X}_A)}{n_A}+\frac{\bar{X}_B(1-\bar{X}_B)}{n_B}}} \overset{a}{\sim} N(0,1)$

$\frac{(\bar{X}_A-\bar{X}_B)}{\sqrt{\frac{n_A\bar{X}_A+n_B\bar{X}_B}{n_A+n_B}\left(1-\frac{n_A\bar{X}_A+n_B\bar{X}_B}{n_A+n_B}\right)\left(\frac{1}{n_A}+\frac{1}{n_B}\right)}} \overset{a}{\sim}_{p_A=p_B} N(0,1)$

$\text{RRMP}_{\alpha_0}(\theta=\theta_0, \theta=\theta_1) = \left\{\underline{x} : \frac{f(\underline{x}|\theta_1)}{f(\underline{x}|\theta_0)} \ge c\right\}$

$c : P\left[\underline{X} \in \text{RRMP}_{\alpha_0}(\theta=\theta_0,\theta=\theta_1)|\theta=\theta_0\right] \le \alpha_0$

$\text{RRRV}_{\alpha_0}(\theta\in\Theta_0, \theta\in\Theta_1) = \left\{\underline{x} : \frac{\sup_{\theta\in\Theta_0} L(\theta|\underline{x})}{\sup_{\theta\in\Theta} L(\theta|\underline{x})} \le c\right\}$

$c : \sup_{\theta\in\Theta_0} P\left[\underline{X} \in \text{RRRV}_{\alpha_0}(\theta\in\Theta_0,\theta\in\Theta_1)|\theta\right] \le \alpha_0$

Cap. 6

$\sum_{i=1}^{r}\sum_{j=1}^{s}\frac{\left(N_{ij}-\frac{N_{i\bullet}\times N_{\bullet j}}{n}\right)^2}{\frac{N_{i\bullet}\times N_{\bullet j}}{n}} \overset{a}{\sim}_{H_0} \chi^2_{(r-1)(s-1)}$

$-2\sum_{i=1}^r\sum_{j=1}^s N_{ij} \times \ln\left(\frac{\frac{N_{i\bullet}\times N_{\bullet j}}{n}}{N_{ij}}\right) \overset{a}{\sim}_{H_0} \chi^2_{(r-1)(s-1)}$

$\sum_{i=1}^{r}\sum_{j=1}^{s}\frac{\left(N_{ij}-\frac{n_{i\bullet}\times N_{\bullet j}}{n}\right)^2}{\frac{n_{i\bullet}\times N_{\bullet j}}{n}} \overset{a}{\sim}_{H_0} \chi^2_{(r-1)(s-1)}$

$-2\sum_{i=1}^r\sum_{j=1}^s N_{ij} \times \ln\left(\frac{\frac{n_{i\bullet}\times N_{\bullet j}}{n}}{N_{ij}}\right) \overset{a}{\sim}_{H_0} \chi^2_{(r-1)(s-1)}$

$R = \frac{\left(\sum_{i=1}^n X_iY_i\right)-n\,(\bar{X}\bar{Y})}{\sqrt{\left[\left(\sum_{i=1}^n X_i^2\right)-n(\bar{X})^2\right]\times\left[\left(\sum_{i=1}^n Y_i^2\right)-n(\bar{Y})^2\right]}}$

$\sqrt{n-2}\,\frac{R}{\sqrt{1-R^2}} \sim_{\rho=0} t_{(n-2)}$

$Z(R) = \frac{1}{2}\times\ln\left(\frac{1+R}{1-R}\right) = \tanh^{-1}(R)$

$\sqrt{n-3}\times[Z(R)-Z(\rho)] \overset{a}{\sim} N(0,1)$

$\frac{Z(R_1)-Z(R_2)}{\sqrt{\frac{1}{n_1-3}+\frac{1}{n_2-3}}} \overset{a}{\sim}_{\rho_1=\rho_2} N(0,1)$

$\frac{\bar{W}-\mu_W}{S_W/\sqrt{n}} \sim t_{(n-1)}$, onde $W_i = X_i - Y_i$, $i=1,\ldots,n$