$$\sigma^2 = \frac{1}{N}\sum_{i=1}^{N}(x_i - \bar{x})^2$$

$$F_X(x) = P(X \leq x)$$

$$E[x] = \sum_{i=1}^{N} x_i f(x_i)$$

$$D[x] = \sum_{i=1}^{N}(x_i - E[x])^2 f(x_i) = \sum_{i=1}^{N} x_i^2 f(x_i) - E[x]^2$$

$$f(x) = \frac{1}{n}$$

$$f(x) = p^x(1-p)^{1-x}$$

$$f(x) = \left(\begin{array}{c} n \\ x \end{array} \right) p^x(1-p)^{n-x}$$

$$\left(\begin{array}{c} n \\ x \end{array} \right) = \frac{n!}{(n-x)!x!}$$

$$f(x) = \exp\{-\lambda\}\frac{\lambda^x}{x!}$$

$$f(x) = p(1-p)^x$$

$$f(x) = p_x$$

$$P(X \in \langle a, b\rangle) = F(b) - F(a)$$

$$f(x) = \frac{\partial F(x)}{\partial x}$$

$$F(x) = \int_{-\infty}^{x} f(t)\; dt$$

$$\int_{-\infty}^{\infty} f(x)\; dx = 1$$

$$\int_{a}^{b} f(x)\; dx = P(X \in \langle a, b\rangle)$$

$$E[x] = \int_{-\infty}^{\infty} x f(x)\; dx$$

$$D[x] = \int_{-\infty}^{\infty}(x - E[x])^2 f(x)\; dx = \int_{-\infty}^{\infty} x^2 f(x)\; dx - E[x]^2$$

$$\int_{-\infty}^{\xi_\alpha} f(x)\; dx = \alpha$$

$$\int_{-\infty}^{\tilde{x}_{0.5}} f(x)\; dx = 0.5$$

$$\int_{z_\alpha}^{\infty} f(x)\; dx = \alpha$$

$$f(x) = \frac{1}{\sqrt{2\pi\sigma^2}}\exp\{-\frac{1}{2\sigma^2}(x-\mu)^2\}$$

$$z = \frac{x-\mu}{\sigma}$$

$$f(z) = \frac{1}{\sqrt{2\pi}}\exp\{-\frac{1}{2}z^2\}$$

$$f(x) = \begin{cases} \frac{1}{b-a} & pro \quad x \in (a,b) \\ 0 & pro \quad x \notin (a,b) \end{cases}$$

$$f(x) = ae^{-ax}$$

$$\chi^2(n) = \sum_{i=1}^{n}(N_i(0,1))^2$$

$$t(n) = \frac{N(0,1)}{\chi^2(n)/n}$$

$$F(n_1, n_2) = \frac{\chi^2(n_1)}{n_1} / \frac{\chi^2(n_2)}{n_2}$$

$$f\,(x,y) = f\,(x|y)\; f\,(y)$$

$$f\,(x|y) = \frac{f\,(x,y)}{f\,(y)}$$

$$f(x,y) = f(x)f(y)$$

$$C[X,Y] = \frac{1}{n}\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})$$

$$\rho_{xy} = \frac{C[X,Y]}{\sigma_X\sigma_Y}$$

$$y_i = b_0 + b_1x_i + e_i$$

$$\sum_{i=1}^{N} e_i^2 = \sum_{i=1}^{N}(y_i - b_0 - b_1x_i)^2 \quad \Rightarrow \quad \min$$

$$\hat{b}_1 = \frac{\sum_{i=1}^{N}(x_i - \bar{x})(y_i - \bar{y})}{\sum_{i=1}^{N}(x_i - \bar{x})^2}$$

$$\hat{b}_0 = \bar{y} - \hat{b}_1\hat{x}$$

$$\hat{b} = (X'X)^{-1}X'Y,$$

$$y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_5 + \ldots + b_nx_n + e$$

$$y = b_0\exp\{b_1x\}$$

$$y = b_0 + b_1x + b_2x^2 + b_3x^3 + \ldots + b_nx^n + e$$

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

$$T = \frac{\max(X) - \min(X)}{s}$$

$$T = \max(F_{teor}(X_i) - F_{test}(X_i))$$

$$W = \frac{b^2}{(n-1)s^2}$$

$$b = a_1(r_n - r_1) + a_2(r_{n-1} - r_2) + ...,$$

$$T = \sum_{i=1}^{n}\frac{(O_i - E_i)^2}{E_i}$$

$$T = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

$$T = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$T = \frac{\bar{X}_d}{s_d}\sqrt{n}$$

$$\bar{X}_d = \frac{1}{n}\sum_{i=1}^{n}(X_{1,i} - X_{2,i})$$

$$s_d = \sqrt{\frac{\sum_{i=1}^{n}(X_{1,i} - X_{2,i})^2}{n} - \bar{X}_d^2}$$

$$T = \frac{s_1^2}{s_2^2}$$

$$U_x = n_1 n_2 + \frac{n_1(n_1+1)}{2} - T_x$$

$$U_y = n_1 n_2 + \frac{n_2(n_2+1)}{2} - T_y$$

$$T = \frac{2b - n}{\sqrt{n}}$$

$$W = \sum_{i}^{n} s_i r_i$$

$$T = (N-1)\frac{\sum_{i=1}^{k} n_i(\bar{r}_i - \bar{r})^2}{\sum_{i=1}^{k}\sum_{j=1}^{n_i}(r_{ij} - \bar{r})^2}$$

$$T = 3n(k+1)\sum_{i=1}^{k} R_i$$

$$T = \frac{r}{\sqrt{\frac{1-r^2}{n-2}}}$$

$$r = \frac{s_{xy}}{\sqrt{s_x^2 s_y^2}}$$

$$s_{xy} = \frac{1}{n-1}\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})$$

$$r_s = 1 - \frac{6\sum_{i=1}^{n} d_i^2}{n(n^2-1)}$$

$$\gamma = \frac{N_c - N_d}{N_c + N_d}$$

$$T = \gamma\sqrt{\frac{N_c + N_d}{n(1-\gamma^2)}}$$

$$y_i - \bar{y} = y_i - \hat{y}_i + \hat{y}_i - \bar{y}$$

$$F = \frac{(n-2)\sum_{i=1}^{n}(\hat{y}_i - \bar{y})^2}{\sum_{i=1}^{n}(y_i - \hat{y}_i)^2}$$

$$T = \frac{2b - (n-2)}{\sqrt{n-1}}$$

$$T = \frac{p - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$$

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

$$T = \frac{(n_{01} - n_{10})^2}{n_{01} + n_{10}}$$