Formuleblad / *Formula page* 55336 ON 354 (2019.11.13)

$$P(N_t = n) = \frac{e^{-\lambda t}(\lambda t)^n}{n!}$$
$$\int_0^{\triangle t} \lambda e^{-\lambda t} dt = 1 - e^{-\lambda \triangle t}$$
$$e^{-\lambda \triangle t} = 1 - \lambda \triangle + o(\triangle t)$$
$$\int_0^{\triangle t} \mu e^{-\mu t} = 1 - e^{-\mu \triangle t}$$
$$\lambda_{j-1}\pi_{j-1} + \mu_{j+1}\pi_{j+1} = \pi_j(\lambda_j + \mu_j)$$
$$c_j = \frac{\lambda_0 \lambda_1 \dots \lambda_{j-1}}{\mu_1 \mu_2 \dots \mu_j}$$
$$\pi_0 = \frac{1}{1 + \sum_{j=1}^{\infty} c_j}$$
$$\pi_0 = 1 - \rho$$
$$\pi_j = \rho^j (1 - \rho)$$
$$L = \frac{\lambda}{\mu - \lambda}$$
$$L_q = \frac{\lambda^2}{\mu(\mu - \lambda)}$$
$$L_s = \rho$$
$$L = \lambda W$$
$$L_q = \lambda W_q$$
$$L_s = \lambda W_s$$
$$\pi_0 = \frac{1 - \rho}{1 - \rho^{c+1}}$$
$$\pi_j = \rho^j \pi_0$$
$$L = \frac{\rho\left[1 - \rho^c(1 + c) + c\rho^{c+1}\right]}{(1 - \rho^{c+1})(1 - \rho)}$$
$$\pi_j = \frac{1}{c + 1}$$
$$L = \frac{c}{2}$$
$$L_s = 1 - \pi_0$$
$$W = \frac{L}{\lambda(1 - \pi_c)}$$
$$W_q = \frac{L_q}{\lambda(1 - \pi_c)}$$

$$\pi_0 = \frac{1}{\left[\left(\sum_{j=0}^{s-1} \frac{(s\rho)^j}{j!}\right) + \left(\frac{(s\rho)^s}{s!(1-\rho)}\right)\right]}$$
$$\pi_j = \frac{(s\rho)^j \pi_0}{j!}$$
$$\pi_j = \frac{(s\rho)^j \pi_0}{s! s^{j-s}}$$
$$P(j \geq s) = \pi_0 \frac{(s\rho)^s}{s!(1 - \rho)}$$
$$L_q = \frac{P(j \geq s)\rho}{1 - \rho}$$
$$W_q = \frac{L_q}{\lambda}$$
$$L_s = \frac{\lambda}{\mu}$$
$$W = \frac{P(j \geq s)}{s\mu - \lambda} + \frac{1}{\mu}$$
$$P(W > t) = e^{-\mu t}\left\{1 + P(j \geq s)\frac{1 - e^{-\mu t(s-1-s\rho)}}{s - 1 - s\rho}\right\}$$
$$P(W > t) = e^{-\mu t}\left\{1 + P(j \geq s)\mu t\right\}$$
$$P(W_q > t) = P(j \geq s)e^{-s\mu(1-\rho)t}$$
$$L = \frac{\lambda}{\mu}$$
$$\pi_j = \frac{\left(\frac{\lambda}{\mu}\right)^j e^{-\frac{\lambda}{\mu}}}{j!}$$
$$E(X) \approx Var(X) \approx \frac{\lambda}{\mu}$$
$$L_q = \frac{\lambda^2\sigma^2 + \rho^2}{2(1 - \rho)}$$
$$L_s = \rho = \frac{\lambda}{\mu}$$
$$W_q = \frac{L_q}{\lambda}$$
$$W = W_q + \frac{1}{\mu}$$
$$E(X) = \sum_{alle\ k} x_k P(X = x_k)$$
$$Var(X) = \sum_{alle\ k} [x_k - E(X)]^2 P(X = x_k)$$

$$\binom{K}{j} = \frac{K!}{j!(K-j)!}$$
$$\lambda_j = (K-j)\lambda$$
$$\mu_j = j\mu$$
$$\pi_j = \binom{K}{j}\rho^j\pi_0$$
$$\pi_j = \frac{\binom{K}{j}\rho^j j!\pi_0}{R!R^{j-R}}$$
$$L = \sum_{j=0}^{K} j\pi_j$$
$$L_q = \sum_{j=R}^{K}(j-R)\pi_j$$
$$\overline{\lambda} = \sum_{j=0}^{K}\pi_j\lambda_j$$
$$\overline{\lambda} = (K-L)\lambda$$
$$\phi_i = 1 - \sum_{j=1}^{k} p_{ij}$$
$$\lambda_j = r_j + \sum_{i=1}^{k} p_{ij}\lambda_i$$
$$\lambda = r_1 + r_2 + \ldots + r_k$$
$$L = L_s = \frac{\lambda(1-\pi_s)}{\mu}$$
$$\pi_s = \frac{\rho^s/s!}{\sum_{j=0}^{s}\frac{\rho^j}{j!}}$$
$$k = \lceil \log_2(n) + 1 \rceil$$
$$\chi^2 = \sum_{i=1}^{k}\frac{(o_i - e_i)^2}{e_i}$$
$$\lambda_s = \sum_{i=1}^{S}\lambda_i p_{is}$$
$$\rho_s = \frac{\lambda_s}{\mu_s}$$
$$\tau = \binom{N+S-1}{S-1}$$
$$S_N = \{\bar{n}_1, \bar{n}_2, \ldots, \bar{n}_\tau\}$$
$$\bar{n}_i = [n_{i1}, n_{i2}, n_{i3}, \ldots, n_{iS}]$$
$$\Pi_N(\bar{n}_i) = \frac{\prod_{j=1}^{S}\rho_j^{n_{ij}}}{G(N)}$$
$$G(N) = \sum_{i=1}^{\tau}\prod_{j=1}^{S}\rho_j^{n_{ij}}$$
$$\Gamma_{s\eta} = \sum_{\substack{i=1 \\ n_{is}=\eta}}^{\tau}\Pi_N(\bar{n}_i)$$
$$L_s = \sum_{\eta=0}^{N}\eta\Gamma_{s\eta}$$
$$\omega_s = (1-\Gamma_{s0})\,\mu_s$$
$$C_i(0) = 1$$
$$C_1(m) = \rho_1^m$$
$$C_i(m) = C_{i-1}(m) + \rho_i C_i(m-1)$$
$$G(N) = C_S(N)$$
$$\pi = \pi P$$
$$h_i + \sum_{k\neq i} b_k p_{ki} = b_i\,(1-p_{ii})$$
$$m_{ij} = 1 + \sum_{k\neq j} p_{ik}m_{kj}$$
$$P = \begin{array}{cc} & \begin{array}{cc} s-m & m \end{array} \\ \begin{array}{c} s-m \\ m \end{array} & \begin{bmatrix} Q & R \\ 0 & I \end{bmatrix} \end{array}$$
$$x_{i+1} = (ax_i + c) \bmod m$$
$$R_i = \frac{x_i}{m}$$
$$F(x) = \int_{-\infty}^{x} f(t)dt$$
$$x^* = a + (b-a)r_1$$
$$r_2 \leq \frac{f(x^*)}{M}$$
$$Z = \frac{\sum_{i=1}^{n} R_i - 0.5n}{\sqrt{\frac{n}{12}}}$$
$$Z = \sum_{i=1}^{12} R_i - 6$$
$$Z_1 = \sqrt{-2\ln(r_1)}\sin(2\pi r_2)$$
$$Z_2 = \sqrt{-2\ln(r_1)}\cos(2\pi r_2)$$
$$X_1 = \mu + \sigma Z_1$$
$$X_2 = \mu + \sigma Z_2$$
$$h = t_{n-1;1-\frac{\alpha}{2}}\frac{s_{\overline{x}}}{\sqrt{n}}$$
$$n^* = n\left(\frac{h}{h^*}\right)^2$$
$$\rho = \frac{\lambda}{\mu}$$
$$\pi_s = \frac{\frac{\rho^s}{s!}}{\sum_{i=0}^{s}\frac{\rho^i}{i!}}$$
$$L = \rho(1-\pi_s)$$