Densidades de Probabilidade

Binomial	$\{0,\ldots,n\}$	$\mathbb{P}(X=k)=C_k^n p^k(1-p)^{n-k}$
Poisson	$\{0,1,2,\ldots\}$	$\mathbb{P}(X=k)=e^{-\lambda}\frac{\lambda^n}{n!},\quad \lambda>0$
Gaussiana	$\mathbb{R}$	$f(x)=\frac{1}{\sigma\sqrt{2\pi}}e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2},\quad \sigma>0,\mu\in\mathbb{R}$
Exponencial	$[0,+\infty[$	$f(t)=\lambda e^{-\lambda t},\quad \lambda>0$
Gamma	$[0,+\infty[$	$f(t)=\lambda e^{-\lambda t}\frac{(\lambda t)^{n-1}}{(n-1)!},\quad n\geq 1$

Processo de Nascimento

$$p_0(t)=e^{-\lambda_0 t}$$

$$p_n(t)=\lambda_{n-1}e^{-\lambda_n t}\int_0^t e^{\lambda_n s}p_{n-1}(s)\,ds,\quad n=1,2,\ldots$$

Se $\lambda_i\neq\lambda_j$ para $i\neq j$, então

$$p_n(t)=\lambda_0\cdots\lambda_{n-1}\sum_{k=0}^{n}\left(\prod_{j=0,j\neq k}^{n}\frac{1}{\lambda_j-\lambda_k}\right)e^{-\lambda_k t},\quad n=1,2,\ldots$$

Processo de Nascimento e Morte

$$\theta_0=1,\qquad \theta_n=\frac{\lambda_0\cdots\lambda_{n-1}}{\mu_1\cdots\mu_n},\quad n=1,2,\ldots$$

$$\pi_n=\frac{\theta_n}{\sum_{n=0}^{\infty}\theta_n},\quad n=0,1,2,\ldots$$

Fila de Espera M/M/1

$$\rho=\frac{\lambda}{\mu},\quad \pi_n=(1-\rho)\rho^n,\quad n\geq 0.$$

$$L=\frac{\rho}{1-\rho},\quad L=\lambda W$$

$$L_0=\frac{\rho^2}{1-\rho},\quad L_0=\lambda W_0$$

Fila de Espera M/M/s

$$\rho=\frac{\lambda}{s\mu},\quad \pi_n=\theta_n\left(\frac{s^s}{s!}\frac{\rho^s}{1-\rho}+\sum_{n=0}^{s-1}\frac{s^n}{n!}\rho^n\right)^{-1},\quad n\geq 0,$$

$$\theta_n=\begin{cases}\frac{s^n}{n!}\rho^n, & n<s\\ \frac{s^s}{s!}\rho^n, & n\geq s\end{cases}$$

$$L=\lambda W,\quad W=W_0+\frac{1}{\mu}$$

$$L_0=\frac{s^s}{s!}\frac{\rho^{s+1}}{(1-\rho)^2}\pi_0,\quad W_0=\frac{L_0}{\lambda}$$