Discrete Distributions

Distribution	$f(x)$	S	$M(t)$	μ	σ^2
Bernoulli	$p^x(1-p)^{1-x}$	$\{0,1\}$	$(1-p)+pe^t$	p	$p(1-p)$
Binomial, $b(n,p)$	$\binom{n}{x}p^x(1-p)^{n-x}$	$\{0,1,\ldots,n\}$	$\left((1-p)+pe^t\right)^n$	np	$np(1-p)$
Geometric	$(1-p)^{x-1}p$	$\{1,2,\ldots\}$	$\dfrac{pe^t}{1-(1-p)e^t}$	$\dfrac{1}{p}$	$\dfrac{1-p}{p^2}$
Hypergeometric	$\dfrac{\binom{N_1}{x}\binom{N_2}{n-x}}{\binom{N}{n}}$	$n-N_2 \le x \le N_1, x \le n$		$n\dfrac{N_1}{N}$	$n\dfrac{N_1}{N}\dfrac{N_2}{N}\dfrac{N-n}{N-1}$
Negative Binomial	$\binom{x-1}{r-1}p^r(1-p)^{x-r}$	$\{r,r+1,r+2,\ldots\}$	$\left(\dfrac{pe^t}{1-(1-p)e^t}\right)^r$	$\dfrac{r}{p}$	$\dfrac{r(1-p)}{p^2}$
Poisson	$\dfrac{\lambda^x e^{-\lambda}}{x!}$	$\{0,1,2,\ldots\}$	$e^{\lambda(e^t-1)}$	λ	λ
Uniform	$\dfrac{1}{m}$	$\{1,2,\ldots,m\}$		$\dfrac{m+1}{2}$	$\dfrac{m^2-1}{12}$

Continuous Distributions

Distribution	$f(x)$	S	$M(t)$	μ	σ^2
Chi-Square, $\chi^2(r)$	$\dfrac{1}{\Gamma(r/2)2^{r/2}}x^{r/2-1}e^{-x/2}$	$x \ge 0$	$(1-2t)^{-r/2}$, $t < \frac{1}{2}$	r	$2r$
Exponential	$\dfrac{1}{\theta}e^{-x/\theta}$	$x \ge 0$	$\dfrac{1}{1-\theta t}$	θ	θ^2
Gamma	$\dfrac{1}{\Gamma(\alpha)\theta^\alpha}x^{\alpha-1}e^{-x/\theta}$	$x \ge 0$	$(1-\theta t)^{-\alpha}$, $t < \frac{1}{\theta}$	$\alpha\theta$	$\alpha\theta^2$
Normal, $N(\mu,\sigma^2)$	$\dfrac{1}{\sigma\sqrt{2\pi}}e^{-\frac{(x-\mu)^2}{2\sigma^2}}$	$x \ge 0$	$e^{\mu t+\frac{\sigma^2}{2}t^2}$	μ	σ^2
Uniform, $U(a,b)$	$\dfrac{1}{b-a}$	$a \le x \le b$	$\dfrac{e^{bt}-e^{at}}{(b-a)t}$	$\dfrac{a+b}{2}$	$\dfrac{(b-a)^2}{12}$