Table (1): Discrete Distributions

Distribution	p.d.f.	E(x)	V(x)	$M_x(t)$
Uniform $x \sim Uni(\theta)$	$f(x)=\begin{cases}\frac{1}{\theta} & x=1,2,\dots\theta\\ 0 & 0.w\end{cases}$	$\frac{\theta+1}{2}$	$\frac{\theta^2-1}{12}$	$\frac{e^t(1-e^{\theta t})}{\theta(1-e^t)}$
Bernoulli معلمة $x\sim Ber(\theta)$	$f(x)=\begin{cases}\theta^x(1-\theta)^{1-x} & x=0,1\\ 0 & 0.w\end{cases}$	θ	$\theta(1-\theta)$	$((1-\theta)+\theta e^t)$
Binomial $x\sim Bin(n,\theta)$	$f(x)=\begin{cases}c_x^n\,\theta^x(1-\theta)^{n-x} & x=0,1,\dots n\\ 0 & 0.w\end{cases}$	$n\theta$	$n\theta(1-\theta)$	$((1-\theta)+\theta e^t)^n$
Poisson $x\sim P(\theta)$	$f(x)=\begin{cases}\frac{e^{-\theta}\theta^x}{x!} & x=0,1,\dots\\ 0 & 0.w\end{cases}$	θ	θ	$e^{\theta(e^t-1)}$
Geometric $x\sim Geo(\theta)$	$f(x)=\begin{cases}\theta(1-\theta)^x & x=0,1,\dots\\ 0 & 0.w\end{cases}$	$\frac{1-\theta}{\theta}$	$\frac{1-\theta}{\theta^2}$	$\frac{\theta}{1-(1-\theta)e^t}$
Negative Binomial $x\sim NB(r,\theta)$	$f(x)=\begin{cases}c_x^{x+r-1}\,\theta^r(1-\theta)^x & x=0,1,\dots\\ 0 & 0.w\end{cases}$	$\frac{r(1-\theta)}{\theta}$	$\frac{r(1-\theta)}{\theta^2}$	$\left[\frac{\theta}{1-(1-\theta)e^t}\right]^r$