APPENDIX A

TABLE OF DISCRETE DISTRIBUTIONS

Distribution	Mass function $\mathbf{p}_X(\mathbf{k})$	$\mathrm{M}_{\mathbf{X}}(t)$ mgf	Mean & Variance
Bernoulli $ber(p)$	$\begin{cases} p^k(1-p)^{1-k} & k=0;1 \\ 0 & \text{elsewhere} \end{cases}$	$\left(1-p+pe^t\right)$	$\mu_X = p$ $\sigma_X^2 = p(1-p)$
Binomial $b(n;\ p)$	$\begin{cases} \binom{n}{x}p^x(1-p)^{n-x} & x=0;1;.;n \\ 0 & \text{elsewhere} \end{cases}$	$\left(1-p+pe^t\right)^n$	$\mu_X = np$ $\sigma_X^2 = np(1-p)$
Geometric $geo(\ p)$	$\begin{cases} (1-p)^{x-1}p, & x=1;2;3;... \\ 0 & \text{elsewhere} \end{cases}$	$\dfrac{pe^t}{1-(1-p)e^t}$	$\mu_X = \dfrac{1}{p}$ $\sigma_X^2 = \dfrac{1-p}{p^2}$
Negative Binomial $nb(r;\ p)$	$\begin{cases} \binom{k-1}{r-1}p^r(1-p)^{k-r}, & k=1;2;... \\ 0 & \text{elsewhere} \end{cases}$	$\left[\frac{pe^t}{(1-(1-p)e^t)}\right]^r$	$\mu_X = \dfrac{r}{p}$ $\sigma_X^2 = \dfrac{r(1-p)}{p^2}$
Poisson $Po(\lambda)$	$\begin{cases} \dfrac{\lambda^k}{k!}e^{-\lambda}, & k=0;1;... \\ 0 & \text{elsewhere} \end{cases}$	$e^{\lambda(e^t-1)}$	$\mu_X = \lambda$ $\sigma_X^2 = \lambda$