TABLE 1
Some Important Arithmetic Distributions

Name	Probability Frequency Function	Parameters	Mean	Variance	Moment Generating Function
Binomial	$\binom{N}{x}p^x q^{N-x}$, $x = 0,1,\ldots,N$	$N = 1,2,\ldots$ $0 < (p = 1-q) < 1$	Np	Npq	$(p\,e^t + q)^N$, $-\infty < t < \infty$
Poisson	$e^{-\lambda}\frac{\lambda^x}{x!}$, $x = 0,1,\ldots$	$\lambda > 0$	λ	λ	$e^{\lambda(e^t-1)}$, $-\infty < t < \infty$
Negative Binomial	$\binom{\alpha+x-1}{x}p^\alpha q^x$, $x = 0,1\ldots$	$\alpha > 0$ $0 < (p = 1-q) < 1$	$\frac{\alpha q}{p}$	$\frac{\alpha q}{p^2}$	$\left(\frac{p}{1-qe^t}\right)^\alpha$, $t < -\log q$
Geometric	$p\,q^x$, $x = 0,1,\ldots$	$0 < (p = 1-q) < 1$	$\frac{q}{p}$	$\frac{q}{p^2}$	$\frac{p}{1-qe^t}$, $t < -\log q$

TABLE 2
Some Important Absolutely Continuous Distributions

Name	Probability Density Function	Parameters	Mean	Variance	Moment Generating Function
Normal	$\frac{1}{\sqrt{2\pi}\sigma}\cdot e^{-\frac{(x-\mu)^2}{2\sigma^2}}$, $-\infty < x < \infty$	$-\infty < \mu < \infty$ $\sigma > 0$	μ	σ^2	$e^{(1/2)\sigma^2 t^2 + \mu t}$, $-\infty < t < \infty$
Gamma	$\frac{\lambda}{\Gamma(\alpha)}(\lambda x)^{\alpha-1}e^{-\lambda x}$, $x > 0$	$\lambda > 0$ $\alpha > 0$	$\frac{\alpha}{\lambda}$	$\frac{\alpha}{\lambda^2}$	$\left(\frac{\lambda}{\lambda-t}\right)^\alpha$, $t < \lambda$
Exponential	$\lambda\,e^{-\lambda x}$, $x > 0$	$\lambda > 0$	$\frac{1}{\lambda}$	$\frac{1}{\lambda^2}$	$\frac{\lambda}{\lambda-t}$, $t < \lambda$
Uniform	$\frac{1}{b-a}$, $a < x < b$	$-\infty < a < b < \infty$	$\frac{a+b}{2}$	$\frac{(b-a)^2}{12}$	$\frac{e^{bt}-e^{at}}{t(b-a)}$, $t \neq 0$