Continous Distrubutions

Name	$f(x)$	$E(X)$	$Var(X)$	$M_X(t)$
$X \sim U(a,b)$	$\frac{1}{b-a},\ a<x<b$	$\frac{a+b}{2}$	$\frac{(b-a)^2}{12}$	$\frac{e^{bt}-e^{at}}{t(b-a)}$
$X \sim \Gamma(\alpha,\beta)$	$\frac{x^{\alpha-1}e^{-\frac{x}{\beta}}}{\beta^{\alpha}\Gamma(\alpha)},\ 0<x<\infty$	$\alpha\beta$	$\alpha\beta^2$	$(1-\beta t)^{-\alpha}$
$X \sim \chi^2(r)$	$\frac{x^{\frac{r}{2}-1}e^{-\frac{x}{2}}}{2^{\frac{r}{2}}\Gamma(\frac{r}{2})},\ 0<x<\infty$	r	$2r$	$(1-2t)^{-\frac{r}{2}}$
$X \sim \exp(\lambda)$	$\frac{1}{\lambda}e^{-\frac{x}{\lambda}},\ 0<x<\infty$	λ	λ^2	$(1-\lambda t)^{-1}$
$X \sim \beta(a,b)$	$\frac{1}{\beta(a,b)}x^{a-1}(1-x)^{b-1},\ 0<x<1$	$\frac{a}{a+b}$	$\frac{ab}{(a+b)^2(a+b+1)}$	∞
$X \sim N(\mu,\sigma^2)$	$\frac{1}{\sqrt{2\pi\sigma^2}}e^{-\frac{1}{2\sigma^2}(x-\mu)^2}, -\infty<x<\infty$	μ	σ^2	$e^{\mu t+\frac{1}{2}\sigma^2t^2}$

Discrete Distrubutions

Name	$f(x)$	$E(X)$	$Var(X)$	$M_X(t)$
$X \sim b(n,p)$	$\binom{n}{x}p^x(1-p)^{n-x}, x=0,1,2,\ldots,n$	np	$np(1-p)$	$(1-p+pe^t)^n$
$X \sim ber(p)$	$p^x(1-p)^{1-x}, x=0,1$	p	$p(1-p)$	$1-p+pe^t$
$X \sim po(\lambda)$	$\frac{\lambda^x e^{-\lambda}}{x!}, x=0,1,2,\ldots,\infty$	λ	λ	$e^{\lambda(e^t-1)}$
$X \sim G(p)$	$p(1-p)^{x-1}, x=1,2,\ldots,\infty$	$\frac{q}{p}$	$\frac{q}{p^2}$	$\frac{p}{1-(1-p)e^t}$

By Mr. Sajad Ahmed