

Chapter 1 : Discrete Distributions :

Name	Probability mass function	Values of X	mean	variance	parameters
<i>Binomial distribution</i>	$f(x) = \binom{n}{x} p^x q^{n-x}$ where , $q = 1 - p$	$X = 0,1,2,\dots,n$	$\mu = E(X) = np$	$\sigma^2 = npq$	n, p
<i>Poisson distribution</i>	$f(x) = \frac{e^{-\lambda} \lambda^x}{x!}$	$X = 0,1,2, \dots$	$\mu = E(X) = \lambda$	$\sigma^2 = \lambda$	λ
<i>Discrete Uniform distribution</i>	$f(x) = \frac{1}{k}$	$X = x_1, x_2, \dots, x_k$	$\mu = E(X) = \frac{\sum x_i}{k}$	$\sigma^2 = \frac{1}{k} \sum_{i=1}^k [x_i - E(X)]^2$	-
<i>Hypergeometric distribution</i>	$f(x) = \frac{\binom{K}{x} \binom{N-K}{n-x}}{\binom{N}{n}}$	$X = 0,1,2,\dots,n$	$\mu = E(X) = \frac{nK}{N}$	$\sigma^2 = \frac{N-n}{N-1} n \frac{K}{N} (1 - \frac{K}{N})$	N, K, n

Chapter 2 : Continuous Distributions :

Name	Probability density function	Values of X	mean	variance	parameters
Continuous Uniform distribution	$f(x) = \frac{1}{b-a}$	$a \leq x \leq b$	$\mu = E(X) = \frac{a+b}{2}$	$\sigma^2 = \frac{(b-a)^2}{12}$	-
Exponential distribution	$f(x) = \lambda e^{-\lambda x}$	$x \geq 0$	$\mu = E(X) = 1/\lambda$	$\sigma^2 = 1/\lambda^2$	λ
Normal Distribution	$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$	$-\infty < x < \infty$	$E(X) = \mu$	$Var(X) = \sigma^2$	μ, σ^2
Standard Normal Distribution	$f(Z) = \frac{1}{\sqrt{2\pi}} e^{-\frac{z^2}{2}}$	$-\infty < Z < \infty$	$E(X) = 0$	$Var(X) = 1$	-
Chi -Square	$\chi^2 = \frac{(n-1)S^2}{\sigma^2}$	$X > 0$	$E(x) = v$	$Var(x) = 2v$	Degree of freedom $v = n - 1$
T - Distribution	$T = \frac{Z}{\sqrt{\frac{V}{v}}}$	$-\infty < t < \infty$	-	-	Degree of freedom $v = n - 1$
F – Distribution	$F = \frac{U/v_1}{V/v_2}$	$X > 0$	-	-	Degree of freedom v_1, v_2