Cheatsheet

Conditional Probability Bayes' Rule

Discrete Random Variables

Let X be a discrete random variable with a pmf of $p(x)$ then

$E[X] = \sum_x xp(x) = \mu$
$Var(X) = E[(X-\mu)^2] = E[X^2] - E[X]^2$

Linear combination of random variables X and Y and fixed numbers a and b:

$E[aX + bY] = aE[X] + bE[Y]$
$Var(aX + bY) = a^2 Var(x) + b^2 Var(Y)$

Distribution	**pmf**	$E(X)$	$Var(X)$
Binomial	$\binom{n}{k} p^k (1-p)^{n-k}$	np	$np(1-p)$
Geometric	$(1-p)^{n-1}p$	$\frac{1}{p}$	$\frac{1-p}{p^2}$
Discrete Uniform	$\frac{1}{n}$	$\frac{a+b}{2}$	$\frac{(b-a+1)^2-1}{12}$
Poisson	$\frac{\lambda^k}{k!}e^{-\lambda}$	λ	λ

Continuous Random Variables