1 Beta Distribution

1.1 Notation

$Beta(\alpha, \beta)$ where $\alpha, \beta > 0$ are the shape parameters.

1.2 Denstiy Function

$f(x) = \frac{x^{\alpha-1}(1-x)^{\beta-1}}{B(\alpha,\beta)}$ where $B(\alpha, \beta) = \frac{\Gamma(\alpha)\Gamma(\beta)}{\Gamma(\alpha+\beta)}$.

1.3 Mean and Variance

$E[X] = \frac{\alpha}{\alpha+\beta}$
$Var[X] = \frac{\alpha\beta}{(\alpha+\beta)^2(\alpha+\beta+1)}$

2 Uniform Distribution

2.1 Notation

$U(a, b)$ where $-\infty < a < b < \infty$.

2.2 Density Function

$f(x) = \frac{1}{b-a}$

2.3 Mean and Variance

$E[X] = \frac{1}{2}(a + b)$
$Var[X] = \frac{1}{12}(b - a)^2$