Discrete random variables

| Distribution | Parameters | Probability function | $E(X)$ | $Var(X)$ |
|---|---|---|---|---|
| Bernoulli | $p$ | $p^x(1-p)^{1-x}$<br>$x = 0, 1,\ 0 < p < 1$ | $p$ | $p(1-p)$ |
| Binomial | $n, p$ | $\binom{n}{x} p^x (1-p)^{n-x}$<br>$x = 0, 1, \ldots, n$ | $np$ | $np(1-p)$ |
| Hyper-geometric | $N, G, n$ | $\binom{G}{x}\binom{N-G}{n-x} / \binom{N}{n}$ | $\frac{nG}{N}$ | $\frac{nG}{N}\frac{N-G}{N}\frac{N-n}{N-1}$ |
| Geometric | $p$ | $(1-p)^{x-1}p$<br>$x = 1, 2, \ldots$ | $\frac{1}{p}$ | $\frac{(1-p)}{p^2}$ |
| Poisson | $\lambda$ | $\frac{e^{-\lambda}\lambda^x}{x!}$<br>$\lambda > 0,\ x = 0, 1, \ldots$ | $\lambda$ | $\lambda$ |

Continuous random variables

| Distribution | Parameter | Density function | $E(X)$ | $Var(X)$ |
|---|---|---|---|---|
| $U[\alpha, \beta]$ | $\alpha, \beta$ | $\frac{1}{\beta-\alpha}$<br>$\alpha \leq x \leq \beta$ | $\frac{\alpha+\beta}{2}$ | $\frac{(\beta-\alpha)^2}{12}$ |
| Exponential | $\lambda$ | $\lambda e^{-\lambda x}$<br>$x \geq 0, \lambda > 0$ | $1/\lambda$ | $1/\lambda^2$ |
| Normal | $\mu, \sigma^2$ | $\frac{1}{\sigma\sqrt{2\pi}} e^{-(x-\mu)^2/2\sigma^2}$<br>$-\infty < x < \infty$<br>$-\infty < \mu < \infty, \sigma > 0$ | $\mu$ | $\sigma^2$ |