Possibly useful formulae

For a discrete random variable

$$\mathsf{E}(X) = \sum_{all x} xP(X = x),$$

$$\mathsf{E}(X^2) = \sum_{all x} x^2 P(X = x),$$

$$\mathsf{E}(g(X)) = \sum_{all x} g(x)P(X = x).$$

For a continuous random variable

$$\mathsf{E}(X) = \int_{-\infty}^{\infty} x f_X(x) dx$$

$$\mathsf{E}(X^2) = \int_{-\infty}^{\infty} x^2 f_X(x) dx,$$

$$\mathsf{E}(g(X)) = \int_{-\infty}^{\infty} g(x) f_X(x) dx.$$

For any random variable

$$\text{Var}(X) = \mathsf{E}(X^2) - [\mathsf{E}(X)]^2$$

For a binomial random variable with parameters n and p:

$$\mathsf{E}(X) = np, \quad \text{Var}(X) = np(1-p), \quad P(X = k) = \binom{n}{k} p^k (1-p)^{n-k}, \quad k = 0, 1, 2, \ldots n$$

For a geometric random variable with parameter p:

$$\mathsf{E}(X) = \frac{1}{p}, \quad \text{Var}(X) = \frac{1-p}{p^2}, \quad P(X = k) = (1-p)^{k-1} p, \quad k = 1, 2, 3, \ldots$$

For a Poisson random variable with parameter λ:

$$\mathsf{E}(X) = \lambda, \quad \text{Var}(X) = \lambda, \quad P(X = k) = e^{-\lambda} \frac{\lambda^k}{k!}, \quad k = 0, 1, 2, \ldots$$

A 95% confidence interval for a parameter has the form:
point estimate $\pm$ 1.96 $\times$ se(point estimate)

A 90% confidence interval for a parameter has the form:
point estimate $\pm$ 1.645 $\times$ se(point estimate)

where point estimate is the estimate of the parameter and $se(\cdot)$ is the standard error of the point estimate.