First line in Formula is the pmf or pdf, other lines are cdf or mgf, depending on usefulness. Names of parameters correspond to definition in R.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Formula | Support/Pars | Mean | Variance | MLE |
| Binomial()  successes out of trials with prob. of success |  |  |  |  |  |
| Geometric  failures and one success with prob |  |  |  |  |  |
| Hypergeometric  red and green marbles in an urn, remove is number of red marbles in the sample |  | = max(0,  ), …, min( |  |  |  |
| Negative Binomial()  is the number of failures before the th success with prob |  | Size = |  |  |  |
| Negative Binomial()  Reparameterization of Neg Bin in terms of the mean and overdispersion , a.k.a. overdispersed Poisson |  | mu =  size = |  |  | must be found by numeric methods. |
| Poisson()  is the expected count in an interval |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Formula | Support/Pars | Mean & Var | MLE | Sampling Distr |
| Normal()  One of many bell-shaped distributions. |  |  |  |  |  |
| Gamma()  Sometimes parameterized with |  | Shape:  Rate:  Scale: |  | No closed form | , but this is not usually useful. |
| Exponential()  aka Gamma(1, ) |  | Rate: |  |  | , so is Inv. Gamma. |
| Exponential()  aka Gamma |  | Scale: |  |  |  |
| Chi-Square()  aka Gamma |  |  |  | No closed form |  |
| Beta() | is not useful | Shape1:  Shape2: |  | No closed form |  |
| Weibull() | is not useful | Shape:  Scale: |  | No closed form |  |
| Lognormal()  If , then is Lognormal | is not useful | Shape:  Scale: |  |  |  |
| Pareto() |  | Scale:  Shape: |  |  | If is known and  , then |