Probabilistic Models

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|  | Model | Formula |
| Binomial Model | The probability of k successes in n Bernoulli trials\*, with probability of success p (q = 1 - p) | P(n, k) = |
| Hypergeometric Model | The probability that in n trials, we get k successes out of and n - k failures out of N –  Binomial Model, but without replacement | P(n, k) = |
| Poisson Model | The probability of k successes in n trials, with probability in the trial | P(n, k) =  = the coefficient of in the expansion of () ()… () |
| Pascal (Negative Binomial)  Model | The probability of the success occurring after k failures in a sequence of Bernoulli trials with probability of success p (q = 1- p) | P(n, k) = |
| Geometrical Model | The probability of the success occurring after k failures in a sequence of Bernoulli trials with probability of success p (q = 1 - p) | P(k)= p |

Common Discrete Distribution

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|  | Pdf of the random variable |
| Bernoulli Distribution  Bern(p) | X |
| Discrete Uniform Distribution  U(m) | X, k = 1, m |
| Binomial Distribution  B(n, p) | X, k = 0, n |
| Hypergeometric Distribution  H(N, , n) | X, k = 0, n |
| Poisson Distribution  P(λ) | X |
| Negative Binomial (Pascal) Distribution  NB(n, p) | X, k = 0, 1, ... |
| Geometric Distribution  Geo(p) | X, k = 0, 1, … |

Common Continuous Distribution

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|  | Pdf of the random variable: f(x) | Cdf: F(x) |
| Uniform Distribution  U(a, b) | f(x) = | F(x) = |
| Normal Distribution  N(μ, σ) | f(x) = |
| Gamma Distribution  B(n, p) | f(x) = |  |
| Exponential Distribution  H(N, , n) | f(x) = |

Student Distribution T(n)

Distribution (n)

Fisher Distribution F(m, n)