Symbol/formula Key:

* μ = average
* σ = standard deviation
* Ø = empty set
* **Mean:**
* **Variance:**
* **Standard Deviation**
  + **For everything its the sqrt(variance)**
* **Sets:**
  + A∩B = Intersection of sets A and B (What’s in both)(A AND B)
  + A∪B = Union of subsets A and B (Add them together) (A AND/OR B)
  + A’ = Complement of subset A (Everything not in the subset)
    - Ā, A’, and are all compliments.
    - P(A) = 1-P(A’)
* **Probability of A Given B:**
  + P()=
* **Permutation:**
  + An ordered arrangement of r distinct objects is called a permutation. The number of ways of ordering n distinct objects (total) taken r at a time(how many) is denoted P(n/r), and by the multiplication rule we have that
* **Combination:**
  + The number of combinations of n objects taken r at a time is the number of subsets, each of size r, that can be formed from the n objects.
    - Where
* **Probability Mass Function:**
  + p(y) = P(Y = y)
    - (Y=y) = set of all points in S assigned the value y by the random variable Y
    - P(Y = y) = The Probability that Y takes on the value of y
* **Binomial Distribution**
  + We can consider specific pmfs that correspond to particular experimental settings, The goal is to find the probability of an event that can either succeed or fail, and run that event some amount of times
  + Pmf of a Binomial Distribution:
  + Expected for Binomial Distribution
    - * Total trials \* chance of success
  + Variance for Binomial Distribution
    - * Total trials \* Probability of success \* probability of failure
* **Geometric Distribution**
  + Counts how long until the very first success
  + **PMF=**
    - * Essentially what is the probability of y failures followed by 1 success
  + **Expected for Geometric Distribution**
    - * 1/chance of success
  + **Variance for Geometric Distribution**
    - * Prob of failure divided by prob of succ^2
  + **Standard Deviation of Geometric for Binomial Distribution**
* **Hypergeometric Distribution**
  + Selecting N items from a population without replacement
    - Exe:
      * Picking y Type 1 items from a set of N total items containing Type 1 and Type 2 items.
        + y = how many you want of desired set in sample
        + r = desired set count
        + N = size of total set
        + n = sample set size
        + N - r = number of items in non-desired set
        + n - y = number of non-desired in sample-set
  + **PMF:**
  + - * + Number of ways of selecting the y Type 1 items from the r available
        + Number of picking n-y Type 2 items from the N-r available
      * Number of ways of selecting n items
  + Expected for Hypergeometric Distribution
    - * Sample size times desired-set divided by total-set-size
  + Variance for Hypergeometric Distribution
* **Negative Binomial Probability Distribution**
  + **PMF:**
  + **Expected**
  + **Variance**
* **Tchebysheff theorem**
* **Uniform Probability**
  + **Probability**
  + **Expected**
  + **Variance**
* **Normal Probability Distribution**
  + **Probability**
  + **Expected**
  + **Varianc**e
* **Gamma Probability Distribution**
  + **Density function**
  + **Expected**
  + **Variance**
* **Beta Probability Distribution**
  + **Density Function:**
  + **Expected**
  + **Variance**
* **Bivariate and Multivariate Probability Distribution**s
* **Marginal and Conditional Probability Distributions**