**Uniform distribution:**

* uniform distribution refers to a probability distribution for which all of the values that a [random variable](https://www.stattrek.com/Help/Glossary.aspx?Target=Random_variable)can take on occur with equal probability.

or probability for each observation in given RV is same in uniform distribution.

* Suppose the random variable X can assume k different values. Suppose also that the P(X = xk) is constant. Then,

P(X = xk) = 1/k

* Ex: When you roll a fair die, the outcomes are 1 to 6. The probabilities of getting these outcomes are equally likely (1/6) and that is the basis of a uniform distribution.
* For a Uniform Distribution, a and b are the parameter, where:
  + a is max value in R.V
  + b is min value in R.V

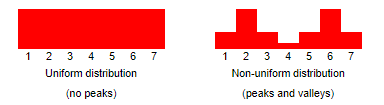
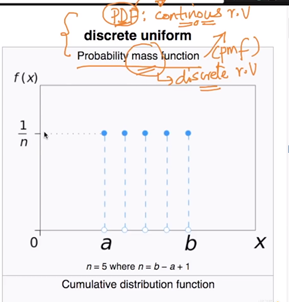


Fig: difference bw uniform and non-uniform distribution.

There are 2 types of uniform distribution:

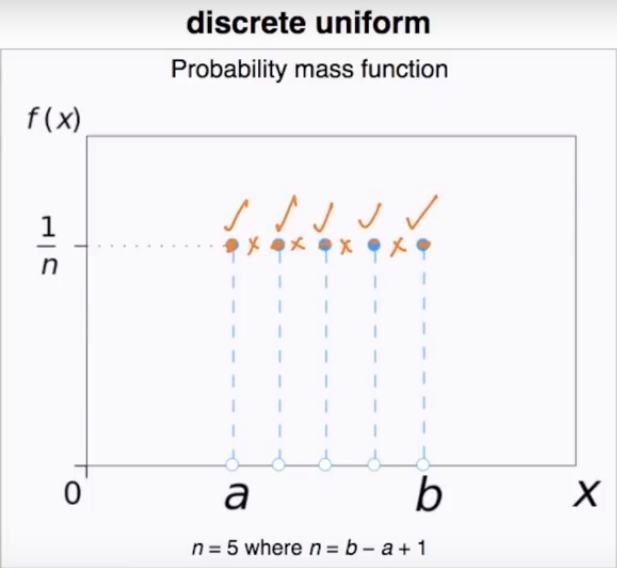
1. Discrete uniform distribution
2. Continuous uniform distribution

**Probability Mass function(PMF) :** It’s similar to PDF, except PMF is used for discrete R.V and PDF is used for continuours R.V. Since It’s PMF of uniform distribution, therefore each point have same probability ie 1/n. where n = b – a +1.

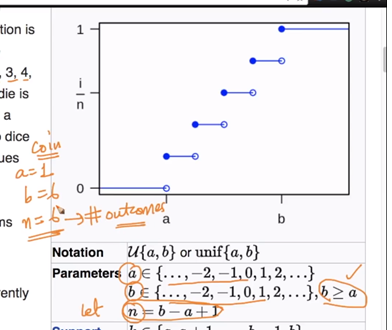


Here at y axis or f(x) is the probability of occuring of each event.

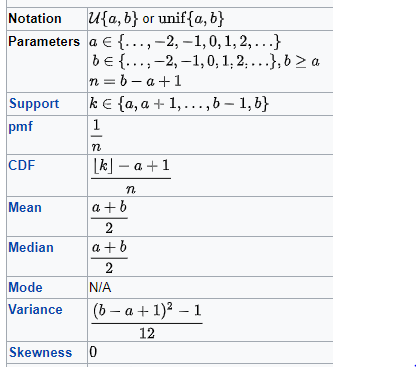
We can’t join these points with a line because we don’t have value in between them, since it’s a discreted RV.



CDF for uniform distribution is shown in below figure, it’s not a smooth curve.



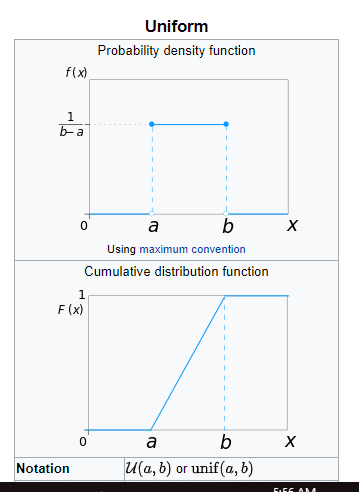
Some of the values for Distcrete uniform distribution.

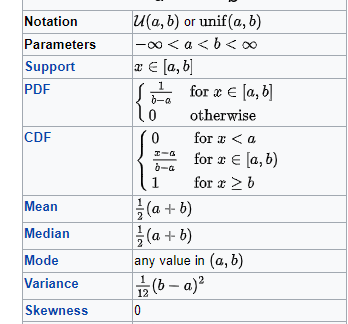


**Continuous uniform distribution:**

The **continuous uniform distribution**is the probability distribution of random number selection from the continuous interval between *a*and *b*, where probability of each observation between a and b in RV is same (since it’s a uniform distribution). It’s also called rectangular distribution.

Also probability at each point is 1/b-a, since for CDF there will be cumulative sum of PDF and CDF should be 1, there prob at each point is 1/b-a.





**Some comments:**

like in case of normal distribution we have 2 parameters ie 'mu' and 'sigma' we define normal distribution as N(mu, sigma)  similarly we have parameters 'a' and 'b' for uniform distribution. as U(a,b) where a and b says at what value function has started(i.e 'a') and at what value function got ended(i.e 'b')