**Statistics : scipy.stats**

The sub-package scipy.stats contains all of the statistics routines, and the info(stats) function returns a pretty thorough list of these functions. The docstring for the stats sub-package additionally contains a list of accessible random variables. This module includes a growing library of statistical functions as well as a huge number of probability distributions.

## Example 1 : Normal Continuous Random Variable:

Continuous random variable is a probability distribution in which the random variable X can have any value. The mean is specified by the location (loc) keyword. The standard deviation is specified via the scale (scale) keyword.

The norm object inherits a series of generic methods from the rv continuous class and completes them with details specific to this particular distribution.

We can pass a list or a NumPy array to compute the CDF at several places. Let's have a look at the following scenario.

*from scipy.stats import norm*

*import numpy as np*

*print(norm.cdf(np.array([1,-1., 0, 1, 3, 4, -2, 6])))*

*Output:*

*[0.84134475 0.15865525 0.5 0.84134475 0.9986501 0.99996833 0.02275013 1. ]*

Example 2 : Uniform Distribution

The uniform function can be used to create a uniform distribution.

*from scipy.stats import uniform*

*print(uniform.cdf([0, 1, 2, 3, 4, 5], loc = 1, scale = 4))*

*Output:*

*[0. 0. 0.25 0.5 0.75 1. ]*

Example 3 : Descriptive Statistics

Basic statistics like Min, Max, Mean, and Variance accept a NumPy array as input and

provide the results.

*from scipy import stats*

*import numpy as np*

*x = np.array([1,2,3,4,5,6,7,8,9])*

*print(x.max(),x.min(),x.mean(),x.var())*

*Output :*

9 1 5.0 6.666666666666667

Example 4 : T-Test

from scipy import stats

rvs = stats.norm.rvs(loc = 5, scale = 10, size = (50,2))

print(stats.ttest\_1samp(rvs,5.0))

Output :

Ttest\_1sampResult(statistic=array([ 1.7744371 , -0.16777637]), pvalue=array([0.08220374, 0.86744977]))