

Introduction to probability distribution

June 14, 2018

1 Starters

- When the random variable is discrete in nature, its probability distribution is characterized by **Probability Mass Function (PMF)**.

No. of fruits sold	no. of customers	PMF
3	30	30/60
5	20	20/60
7	10	10/60
	60	sum = 1

- A **Cumulative Distribution Function (CDF)** defines the less than, greater than or equal to argument of a function.

CDF is a monotonic increasing function.

For the above PMF, CDF of $P(X \leq x)$ could be calculated as -

No. of fruits sold	no. of customers	PMF	CDF
3	30	30/60	30/60
5	20	20/60	(30/60) + (20/60)
7	10	10/60	(30/60) + (20/60) + (10/60)
	60	sum = 1	last value itself becomes 1

- When the random variable is continuous in nature, its probability distribution is characterized by **Probability Density Function (PDF)**.

2 Discrete PD

Topics: Uniform — Binomial — Negative binomial — Poisson

2.1 Uniform

- A random variable which assumes equal probability for its outcomes, is termed as discrete uniform PD.
e.g. getting 5 in a throw of a dice. Same goes with other number on dice.

2.2 Binomial

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