Discrete probability distributions

The probability distribution of a discrete random variables describes the probabilities associated with the values of the random variable.

The probability distribution for the number of months for the completion of a project (introduced under the concept of Probability) is given by the following table:

Table 2
Probability of completing a project

x	Probabilities	$f(x)$
5	$P(1,4) = 0.15$	0.15
6	$P(1,5) + P(2,4) = 0.15 + 0.10$	0.25
7	$P(1,6) + P(2,5) + P(3,4) = 0.05 + 0.20 + 0.05$	0.30
8	$P(2,6) + P(3,5) = 0.05 + 0.10$	0.15
9	$P(3,6) = 0.15$	0.15

2.1 Probability density function (PDF)

The probability density function is referred to as the density function. Mathematically is written as $f(x)$.

$$P(a < X < b) = \int_a^b f(x)dx$$

2.2 Cumulative distribution function (CDF)

The cumulative distribution function is also referred to as the distribution function. The mathematical representation is:

$$F(x) = P(X < x) = \int_{-\infty}^{x} f(x)dx$$