

3. Plotting and fitting of Poisson distribution and graphical representation of probabilities.

The Poisson distribution is a type of discrete probability distribution that determines the likelihood of an event occurring a specific number of times (k) within a designated time or space interval. This distribution is characterized by a single parameter, λ (lambda), representing the average number of occurrences of the event.

Poisson Distribution Formula

$$P(k) = e^{-\lambda} \frac{\lambda^k}{k!}$$

Mean	$\mu = E(X) = \lambda$
Variance	$\sigma^2 = V(X) = \lambda$
Standard Deviation	$\sigma = \sqrt{\sigma^2} = \sqrt{\lambda}$

Where:

- $P(X=k)$ is the probability of observing k events
- e is the base of the natural logarithm (approximately 2.71828)
- λ mean number of success that occur during a specific interval, $\lambda = np$
- k is the number of success

how to implement in excel

POISSON.DIST(number_s,average,cumulative)

POISSON.DIST(k, λ , FALSE)

