

POISSON DISTRIBUTION: THORNDIKE NOMOGRAM

Author: Josemari Sarasola
josemari.sarasola@ehu.eus

Thorndike nomogram is a plot by statistician Frances Thorndike that gives cumulated probabilities for different x values and λ parameters. The nomogram was published in 1926 under the title "Applications of Poisson's probability summation : an outline of the characteristics and uses of probability curves showing Poisson's exponential summation illustrated by a number of actual frequency-distributions" for the Bell Telephone Laboratories journal. Simple probabilities for the Poisson distribution are calculated by this formula:

$$P[X = x] = \frac{e^{-\lambda} \lambda^x}{x!}$$

Hence, cumulated probabilities are calculated in this way:

$$P[X \leq x] = \sum_{i=0}^x \frac{e^{-\lambda} \lambda^i}{i!}$$

Here we give an adaptation of that nomogram in two plots, giving both lower and upper cumulated probabilities respectively, both of them created with R.



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