Poisson Distribution

The **Poisson distribution**is the probability distribution of independent event occurrences in an interval. If *λ*is the [mean](http://www.r-tutor.com/elementary-statistics/numerical-measures/mean) occurrence per interval, then the probability of having *x*occurrences within a given interval is:

       x -Î»
f(x) = Î»-e-- where x = 0,1,2,3,...
        x!


#### Problem

If there are twelve cars crossing a bridge per minute on average, find the probability of having seventeen or more cars crossing the bridge in a particular minute.

#### Solution

The probability of having *sixteen or less*cars crossing the bridge in a particular minute is given by the function ppois.

> ppois(16, lambda=12)   # lower tail

Hence the probability of having seventeen or more cars crossing the bridge in a minute is in the *upper tail*of the probability density function.

> ppois(16, lambda=12, lower=FALSE)   # upper tail

#### Answer

If there are twelve cars crossing a bridge per minute on average, the probability of having seventeen or more cars crossing the bridge in a particular minute is 10.1%