

Possion distribution

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probability density function

Suppose that we can expect some independent events to occur λ times over a specified time interval, then the probability of exactly occurrence of 'x' is equals to

$$P(x, \lambda) = \frac{\lambda^n e^{-\lambda}}{n!}$$

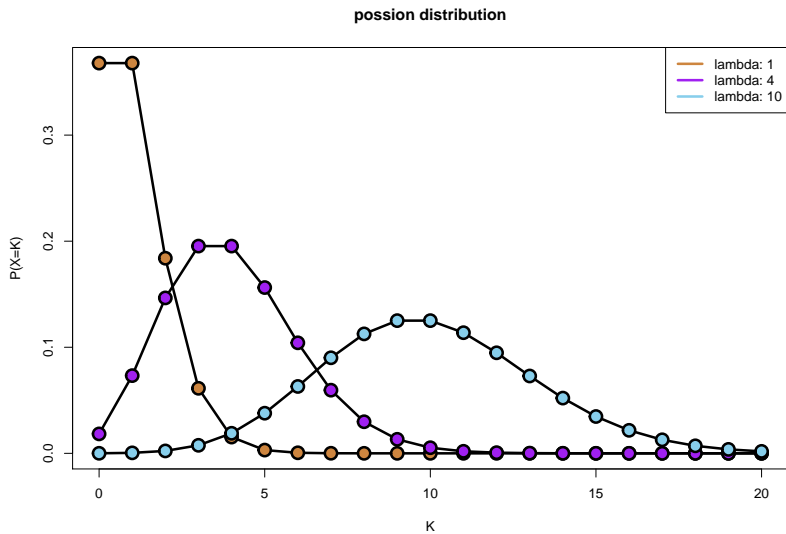
examples

- ▶ A website has 2 visits every second.
- ▶ 3 children are born every mintue.
- ▶ A supermarket sells 4 bags of milk power every hour.

Characteristics

- ▶ small probability
- ▶ independent
- ▶ stable frequency

poission distribution



Poisson distribution: example

- ▶ 3 children are born every minute

What's the probability that at most 2 children will be born in the next minutes $\lambda = 3$

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

```
3^0*exp(-3)/factorial(0)
3^1*exp(-3)/factorial(1)
3^2*exp(-3)/factorial(2)
dpois(0:2,3)
sum(dpois(0:2,3))
ppois(2,3)
```

