# Poisson

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29/6/2020

```
import os
os.environ['QT_QPA_PLATFORM_PLUGIN_PATH'] = 'C:/Users/jxsje/anaconda3/Library/plugins/platforms'
```

## Distribución de Poisson

Supongamos que $X$ modela el número de errores por página que tiene un valor esperado $\lambda = 5$.

```
library(Rlab)
```

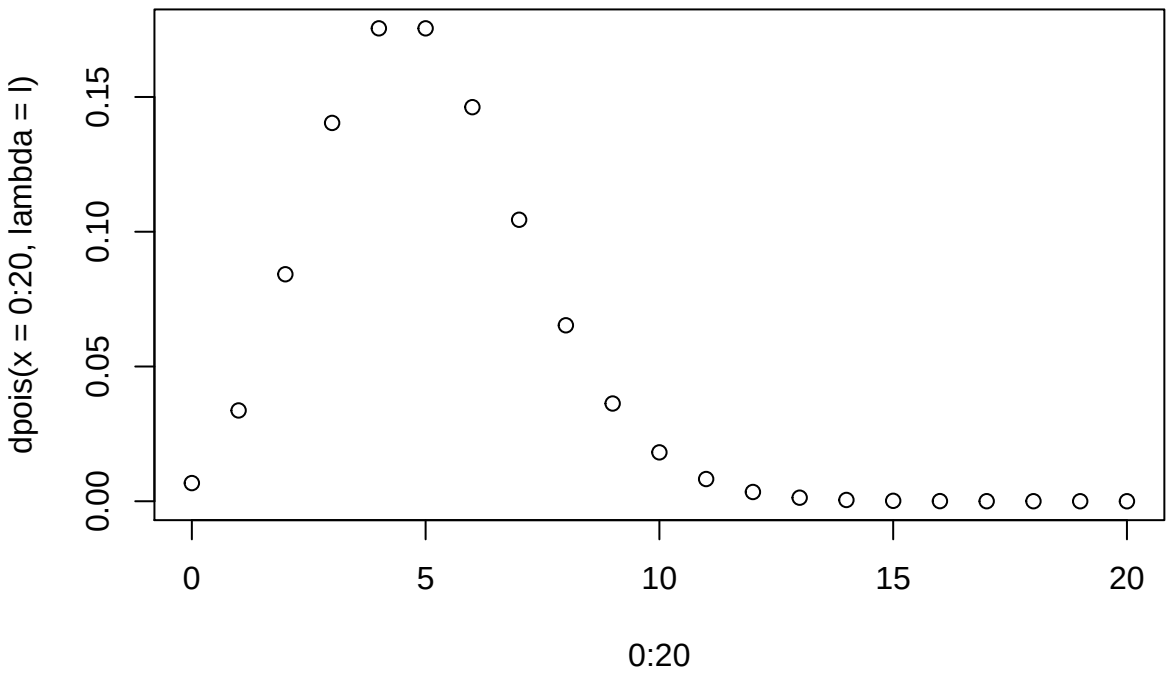
```
## Rlab 2.15.1 attached.
```

```
##
## Attaching package: 'Rlab'
```

```
## The following objects are masked from 'package:stats':
##
##     dexp, dgamma, dweibull, pexp, pgamma, pweibull, qexp, qgamma,
##     qweibull, rexp, rgamma, rweibull
```

```
## The following object is masked from 'package:datasets':
##
##     precip
```

```
l = 5
plot(0:20, dpois(x = 0:20, lambda = l))
```



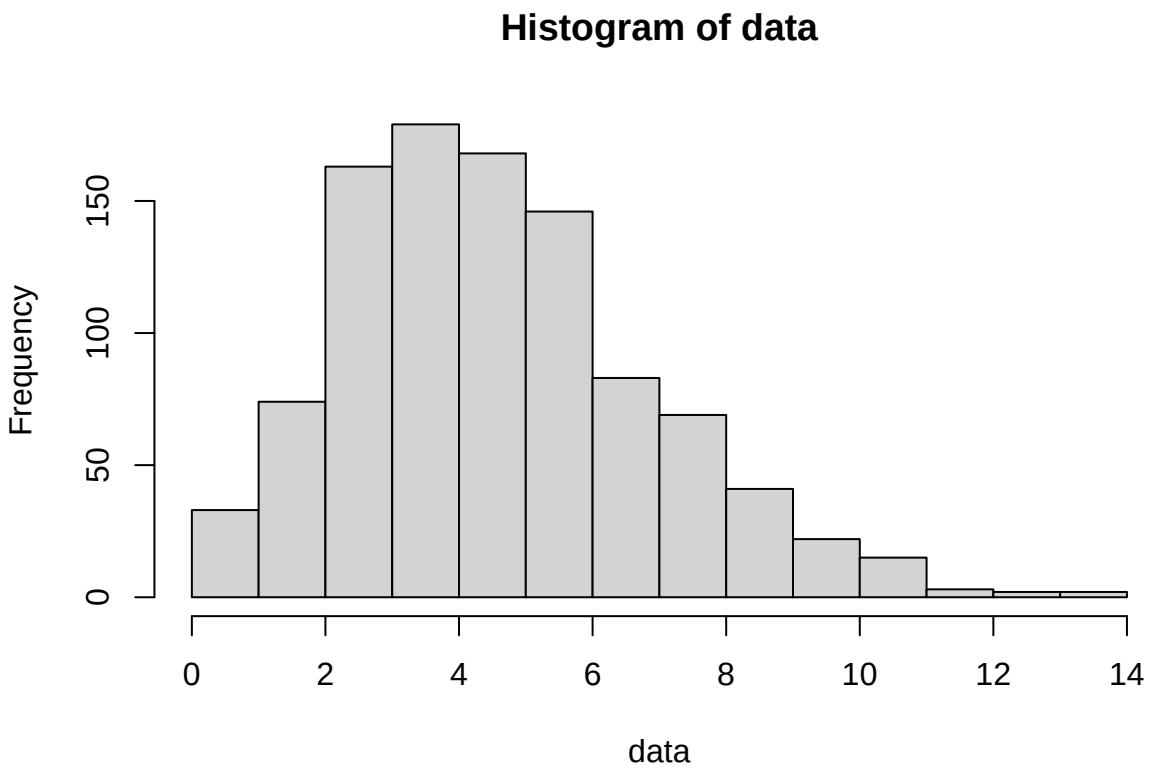

```
ppois(0:20, lambda = l)
```

```
##  [1] 0.006737947 0.040427682 0.124652019 0.265025915 0.440493285 0.615960655
##  [7] 0.762183463 0.866628326 0.931906365 0.968171943 0.986304731 0.994546908
## [13] 0.997981148 0.999302010 0.999773746 0.999930992 0.999980131 0.999994584
## [19] 0.999998598 0.999999655 0.999999919
```

```
qpois(0.5, lambda = l)
```

```
## [1] 5
```

```
rpois(1000, lambda = l) -> data
hist(data)
```




### En Python

```
from scipy.stats import poisson
import numpy as np
import matplotlib.pyplot as plt

fig, ax = plt.subplots(1,1)
mu = 5
mean, var, skew, kurt = poisson.stats(mu, moments = 'mvsk')
print("Media %f"%mean)
```

```
## Media 5.000000
```

```
print("Varianza %f"%var)
```

```
## Varianza 5.000000
```

```
print("Sesgo %f"%skew)
```

```
## Sesgo 0.447214
```

```
print("Curtosis %f"%kurt)
```

```
## Curtosis 0.200000
```

```
x = np.arange(0, 12)
ax.plot(x, poisson.pmf(x, mu), 'bo', ms = 8, label = "Función de Poisson(0.8)")
ax.vlines(x, 0, poisson.pmf(x,mu), colors = 'b', lw = 4, alpha = 0.5)
```

```
ax.legend(loc="best", frameon = False)
plt.show()
```