Binomial

Curso de Estadística Descriptiva

4/2/2019

Función de densidad

Sea $X = B(n = 30, p = 0.6)$,

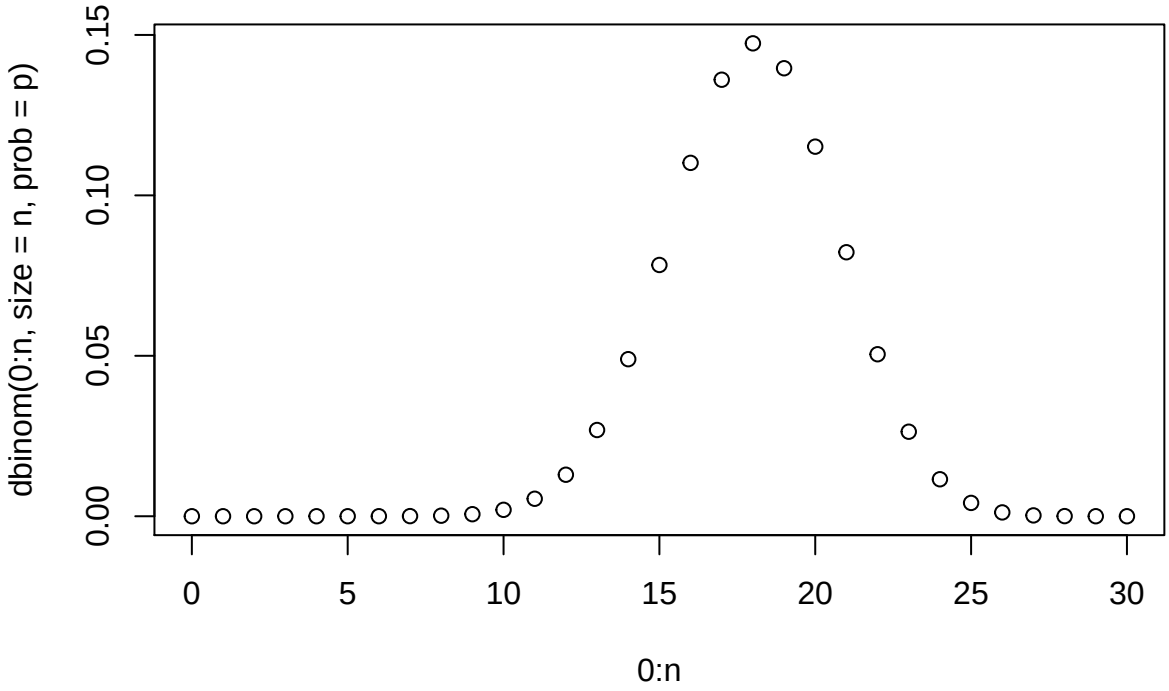
TODO: escribir la FDens y la FDistr

En R

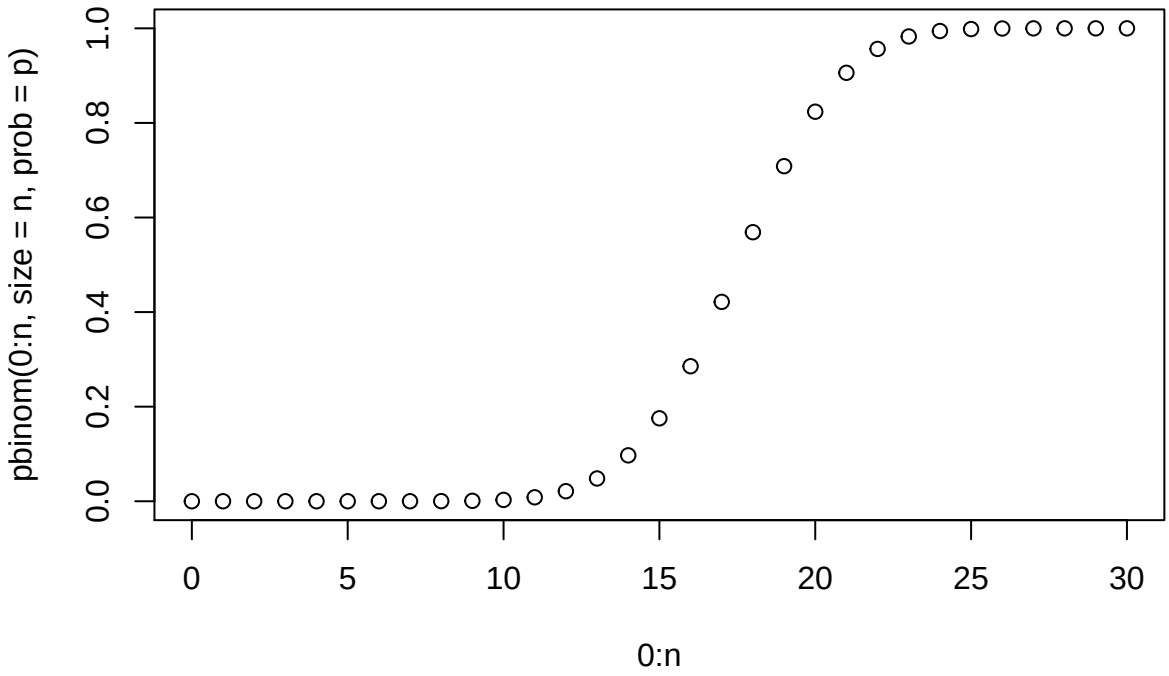
```
library(Rlab)
```

```
## 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
```

```
n = 30
p = 0.6
plot(0:n, dbinom(0:n, size = n, prob = p))
```




```
plot(0:n, pbinom(0:n, size = n, prob = p))
```



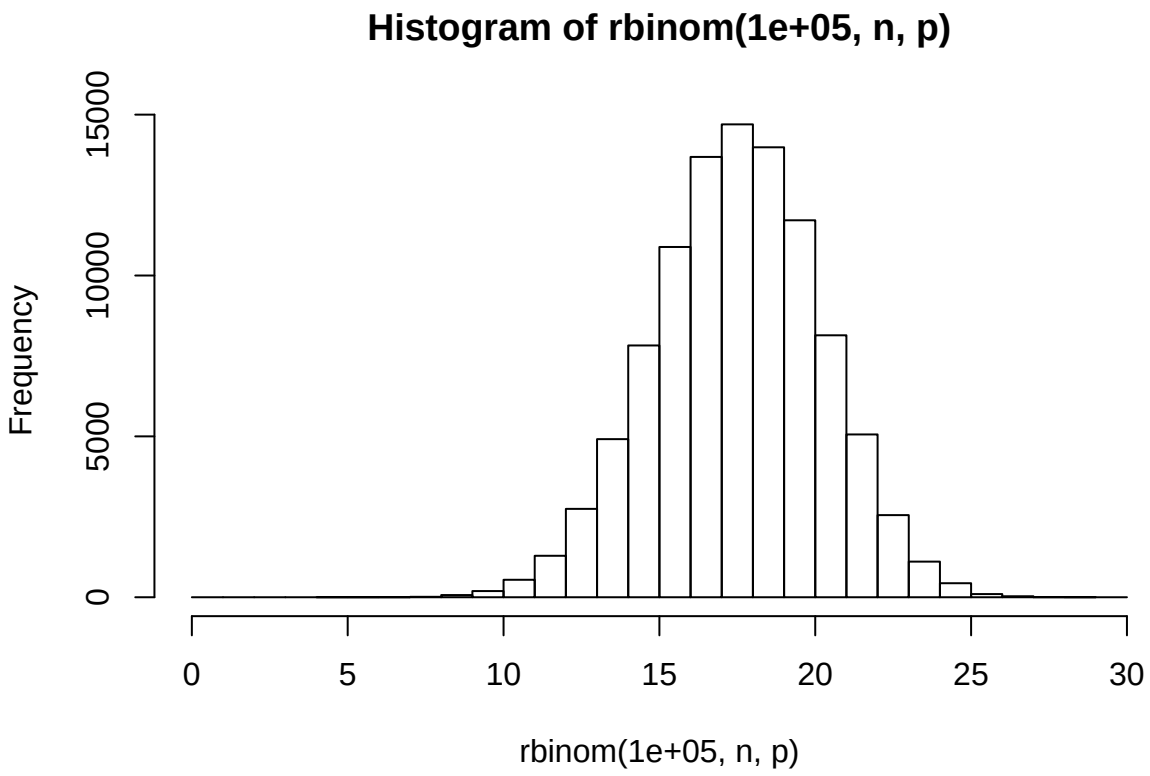

```
qbinom(0.5, n, p)
```

```
## [1] 18
```

```
qbinom(0.25, n, p)
```

```
## [1] 16
```

```
hist(rbinom(100000, n, p), breaks = 0:30)
```



En Python

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

fig, ax = plt.subplots(1,1)
n = 7
p = 0.4

mean, var, skew, kurt = binom.stats(n, p, moments = 'mvsk')

print("Media %f"%mean)
```

```
## Media 2.800000
```

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

```
## Varianza 1.680000
```

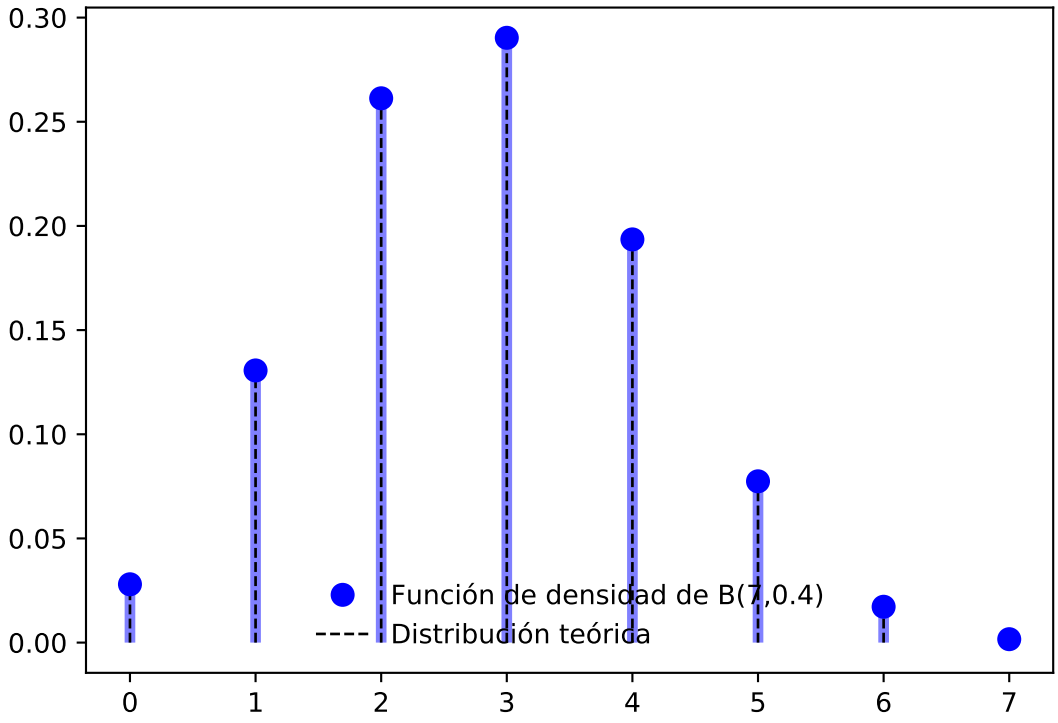
```
print("Sesgo %f"%skew)
```

```
## Sesgo 0.154303
```

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

```
## Curtosis -0.261905
```

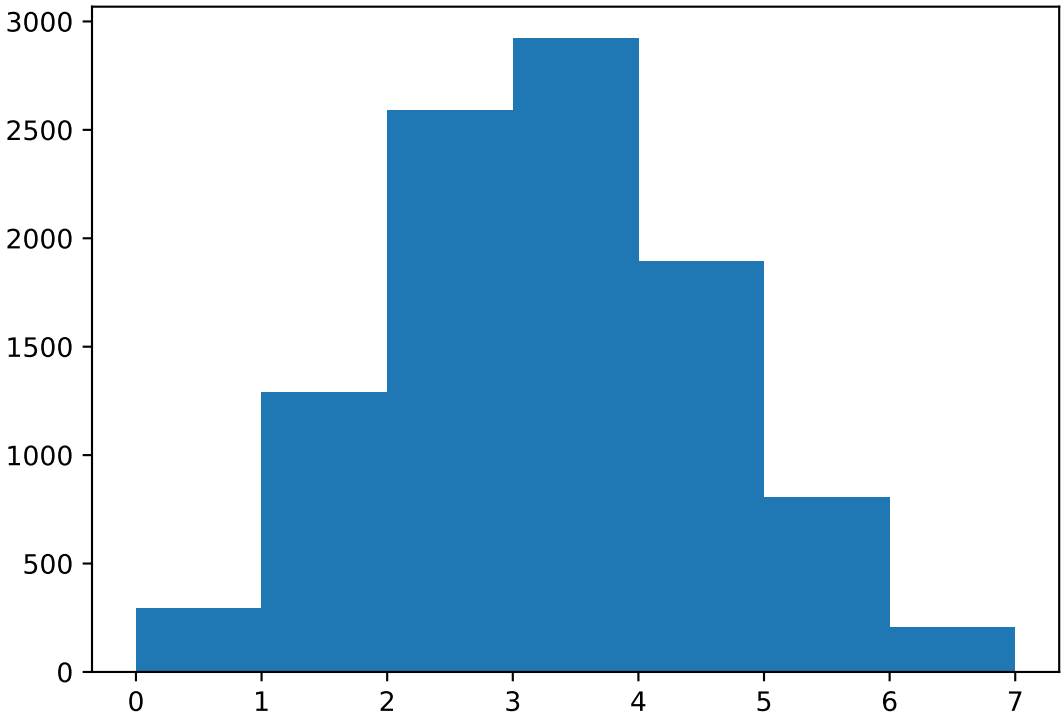
```
x = np.arange(0, n+1)
ax.plot(x, binom.pmf(x, n, p), 'bo', ms = 8, label = "Función de densidad de B(7,0.4)")
ax.vlines(x, 0, binom.pmf(x,n,p), colors = 'b', lw = 4, alpha = 0.5)

rv = binom(n,p)
ax.vlines(x,0, rv.pmf(x), colors = 'k', linestyles='--', lw = 1, label = "Distribución teórica")

ax.legend(loc = 'best', frameon = False)

plt.show()
```




```
fix, ax = plt.subplots(1,1)
r = binom.rvs(n, p, size = 10000)
ax.hist(r, bins = n)
```

```
## (array([ 293., 1287., 2590., 2922., 1894.,  807.,  207.]), array([0., 1., 2., 3., 4., 5., 6., 7.]),
```

```
plt.show()
```


3000
2500
2000
1500
1000
500
0
0
1
2
3
4
5
6
7