A5_Exercises

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Exercise 1 (p. 10)

```
import numpy as np

N=1000
u=np.random.rand(N)
x=-np.log(1-u)/3
print(x[:5])
```

```
## [0.1722533  0.19808974 0.64031454 0.40186018 0.21240166]
```

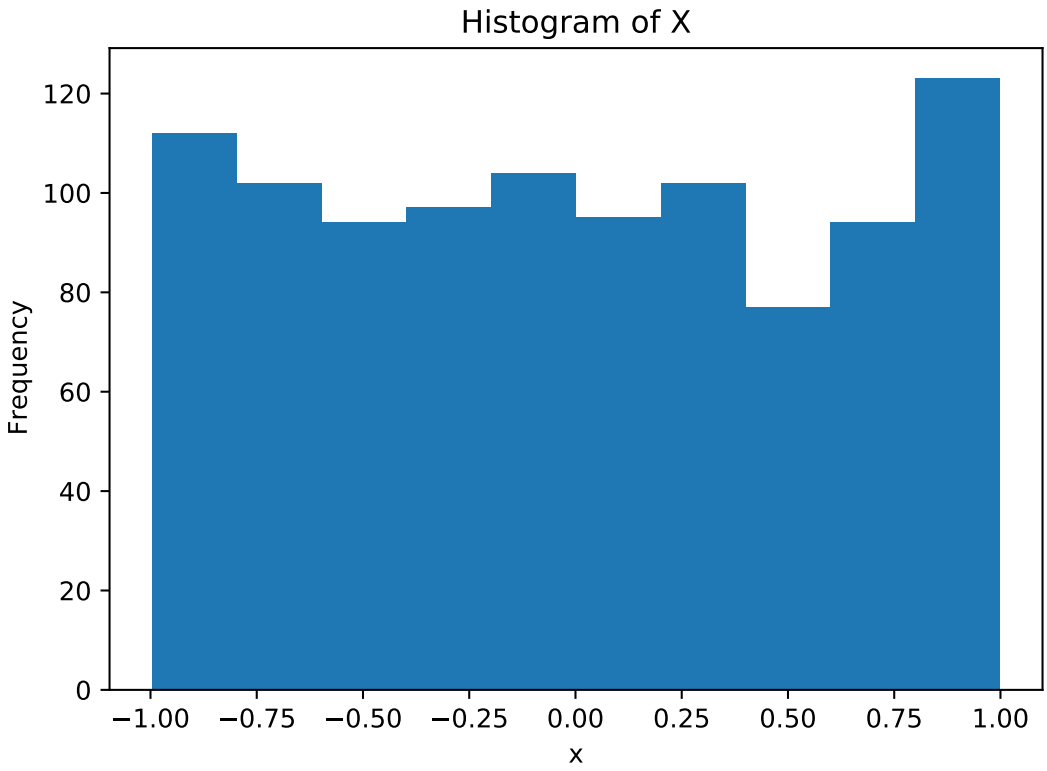
Uniform random numbers (p. 15)

```
import numpy as np
import matplotlib.pyplot as plt

x=np.random.rand(1000)*2-1
plt.hist(x)
```

```
## (array([112., 102.,  94.,  97., 104.,  95., 102.,  77.,  94., 123.]), array([-0.99655971, -
0.79698597, -0.59741224, -0.39783851, -0.19826477,
##         0.00130896,  0.2008827 ,  0.40045643,  0.60003017,  0.7996039 ,
##         0.99917764]), <BarContainer object of 10 artists>)
```

```
plt.xlabel("x")
plt.ylabel("Frequency")
plt.title("Histogram of X")
plt.show()
```



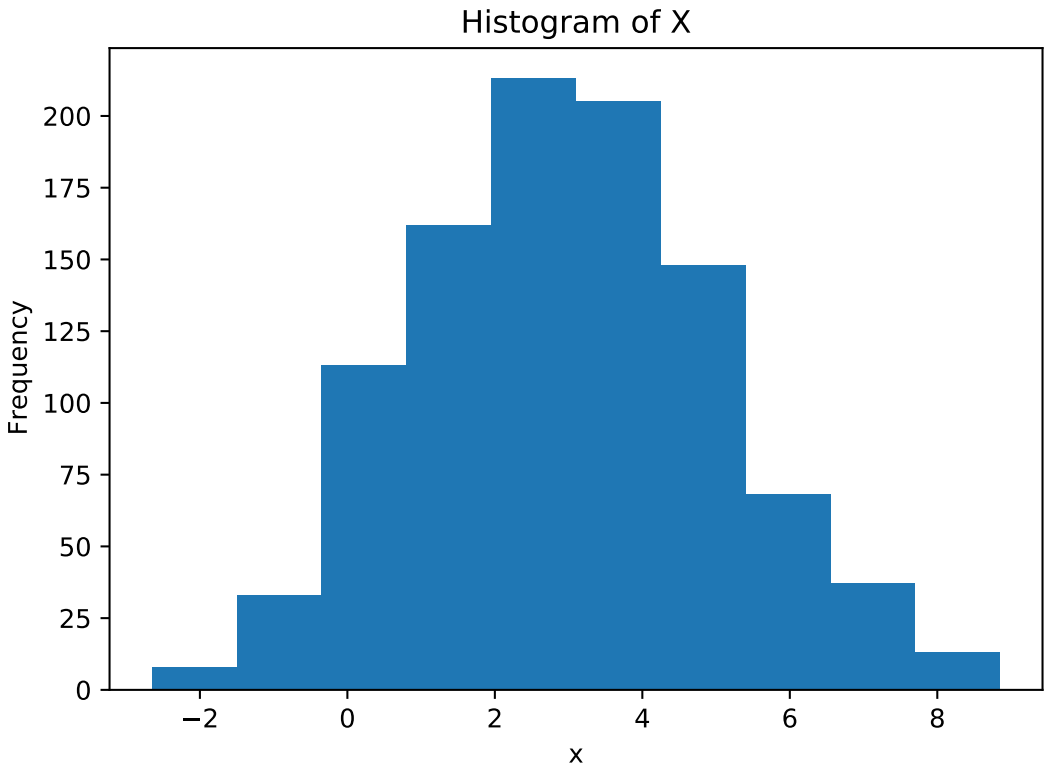
Normal random numbers (p. 16)

```
import numpy as np
import matplotlib.pyplot as plt

x=np.random.normal(3,2,size=1000)
plt.hist(x)
```

```
## (array([  8.,  33., 113., 162., 213., 205., 148.,  68.,  37.,  13.]), array([-2.65023099, -
1.50001685, -0.3498027 ,  0.80041144,  1.95062558,
##         3.10083972,  4.25105386,  5.40126801,  6.55148215,  7.70169629,
##         8.85191043]), <BarContainer object of 10 artists>)
```

```
plt.xlabel("x")
plt.ylabel("Frequency")
plt.title("Histogram of X")
plt.show()
```



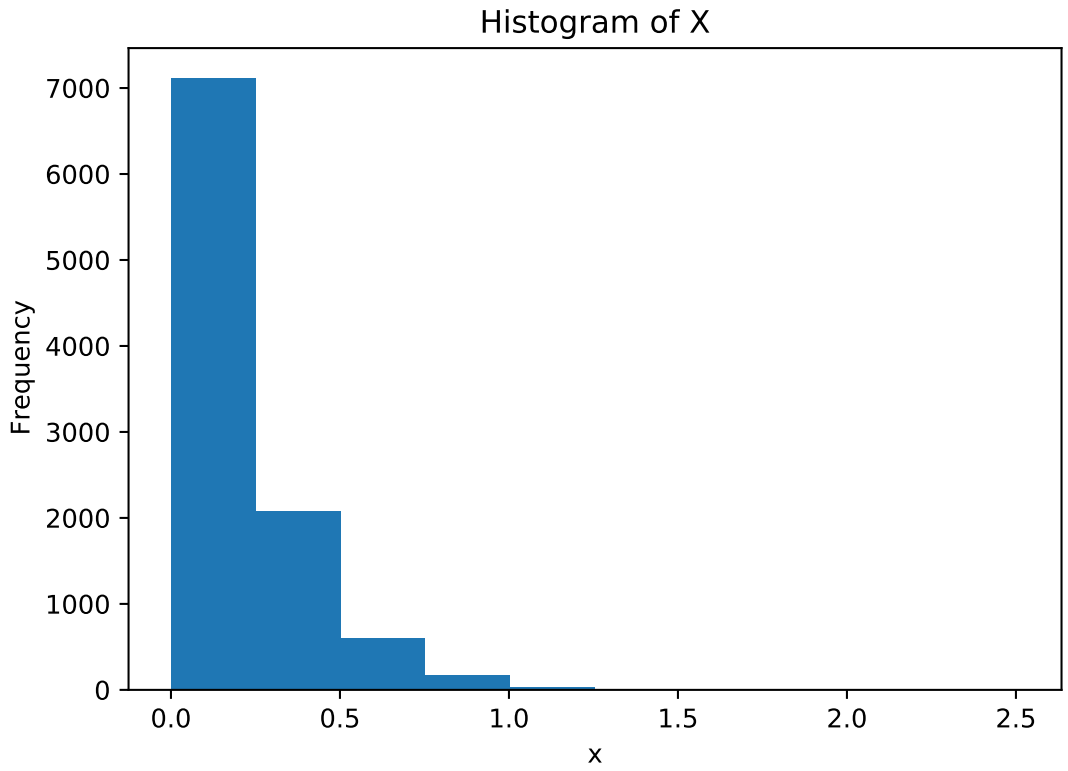
Exponential random numbers (p. 17)

```
import numpy as np
import matplotlib.pyplot as plt

x=np.random.exponential(1/5,size=10000)
plt.hist(x)
```

```
## (array([7.109e+03, 2.072e+03, 6.020e+02, 1.700e+02, 3.300e+01, 1.100e+01,
##         2.000e+00, 0.000e+00, 0.000e+00, 1.000e+00]), array([1.25880286e-05, 2.50954711e-
01, 5.01896834e-01, 7.52838958e-01,
##        1.00378108e+00, 1.25472320e+00, 1.50566533e+00, 1.75660745e+00,
##       2.00754957e+00, 2.25849170e+00, 2.50943382e+00]), <BarContainer object of 10 artists>)
```

```
plt.xlabel("x")
plt.ylabel("Frequency")
plt.title("Histogram of X")
plt.show()
```



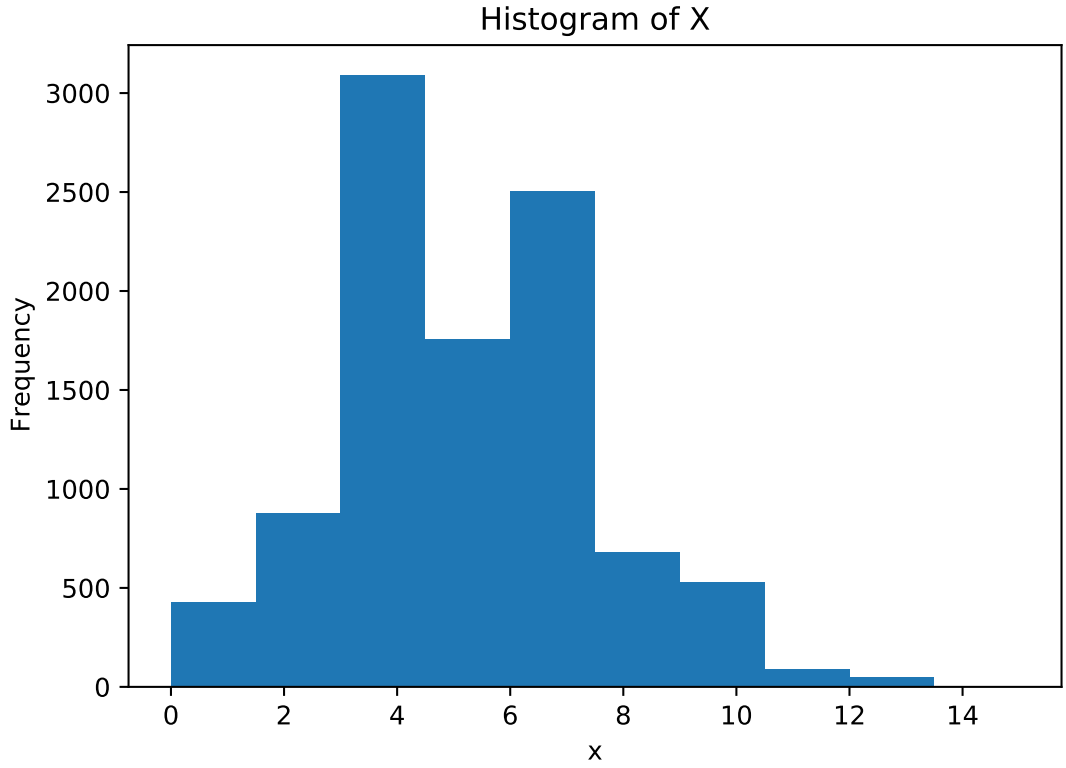
Poisoon random numbers (p. 18)

```
import numpy as np
import matplotlib.pyplot as plt

x=np.random.poisson(5, size=10000)
plt.hist(x)
```

```
## (array([ 429.,  877., 3088., 1754., 2501.,  681.,  529.,   89.,   47.,
##         5.]), array([ 0. ,  1.5,  3. ,  4.5,  6. ,  7.5,  9. , 10.5, 12. , 13.5, 15. ]), <BarContainer object of 10 a
```

```
plt.xlabel("x")
plt.ylabel("Frequency")
plt.title("Histogram of X")
plt.show()
```


Histogram of X
Frequency
3000
2500
2000
1500
1000
500
0
0
2
4
6
8
10
12
14
x