Activity: parameter estimation

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```
import pandas as pd
import matplotlib.pyplot as plt

dfb = pd.read_excel("/content/baterias(1).xlsx")
dfs = pd.read_excel("/content/software.xlsx")

dfb.head()
```

	numero_de_bateria	tiempo_hasta_agotar
0	1	0.156423
1	2	1.003374
2	3	0.438915
3	4	0.304314
4	5	0.056542

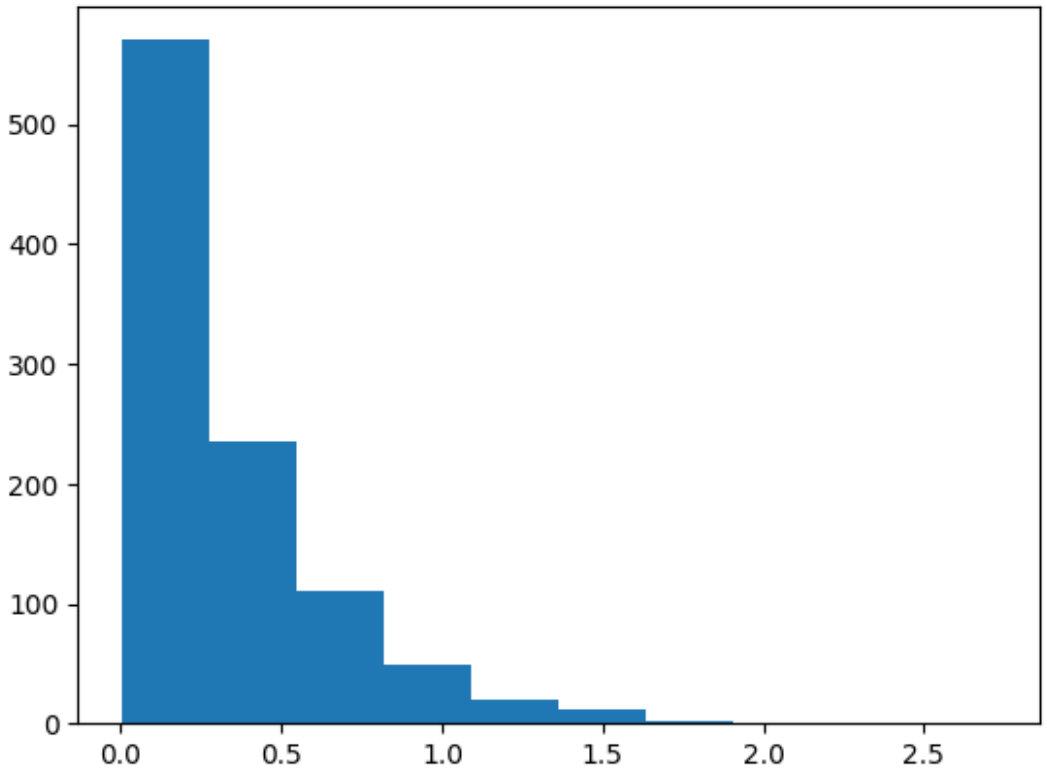
```
dfs.head()
```

	problema	intentos_hasta_resolver
0	1	2
1	2	9
2	3	4
3	4	3
4	5	1

Histograma de Baterias.

```
plt.hist(dfb["tiempo_hasta_agotar"])
```

```
(array([570., 235., 110.,  49.,  20.,  12.,   2.,   1.,   0.,   1.]),
 array([1.54759469e-03, 2.73807688e-01, 5.46067782e-01, 8.18327876e-
01,
        1.09058797e+00, 1.36284806e+00, 1.63510816e+00,
1.90736825e+00,
        2.17962835e+00, 2.45188844e+00, 2.72414853e+00]),
 <BarContainer object of 10 artists>)
```



We compute to obtain

$$\hat{\lambda} = \frac{1}{\acute{x}}$$

```
x_mean = dfb["tiempo_hasta_agotar"].mean()
lambda_hat = 1 / x_mean
x_mean
```

```
0.32416864932174144
```

Then, we calculate

$$\lambda = \frac{1}{\hat{\lambda}}$$

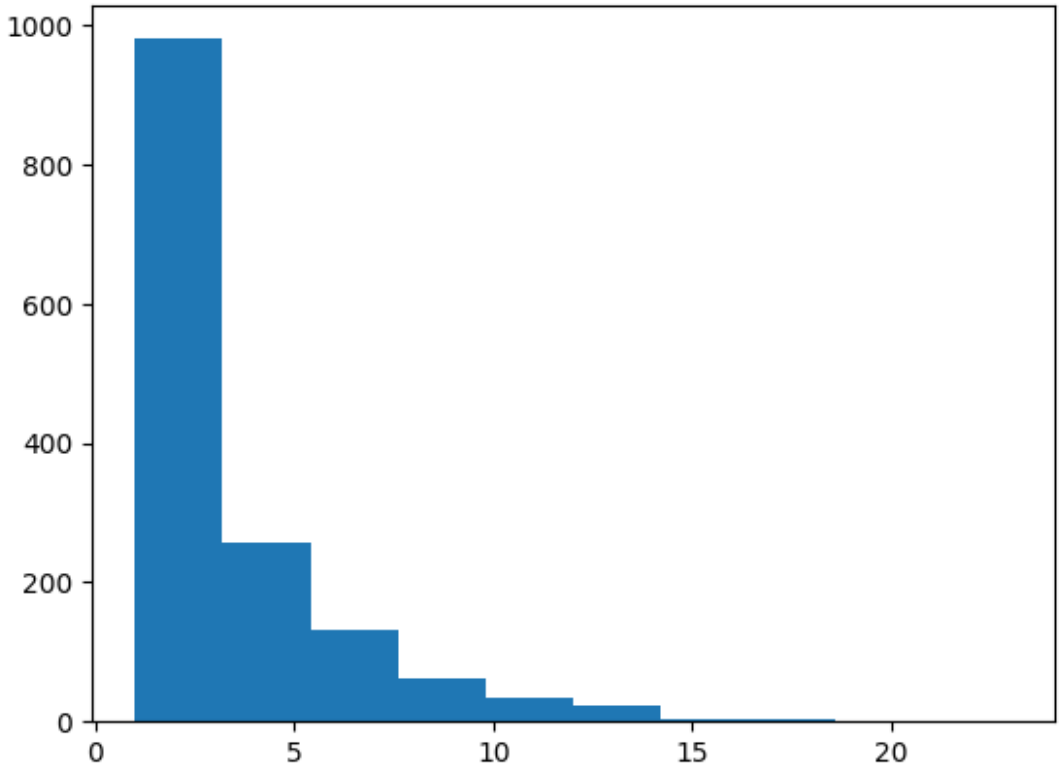
```
expected_lambda = 1 / lambda_hat
expected_lambda
```

```
0.32416864932174144
```

Histograma de Software.

```
plt.hist(dfs["intentos_hasta_resolver"])
```

```
(array([980., 258., 133.,  63.,  35.,  23.,   3.,   3.,   0.,   2.]),
 array([ 1. ,  3.2,  5.4,  7.6,  9.8, 12. , 14.2, 16.4, 18.6, 20.8,
23. ]),
 <BarContainer object of 10 artists>)
```



Geometric Expected Value

$$GEV = \frac{1}{p}$$

```
sum_tries = dfs["intentos_hasta_resolver"].sum()
sum_tries
```

```
5037
```

```
n = dfs["intentos_hasta_resolver"].count()
```

Compute to obtain p

$$\hat{p} = \frac{n}{\sum_{i=1}^{n} i}$$

```
p = n / sum_tries
p
```

```
0.29779630732578916
```

```
gev = 1/p
gev
```

```
3.358
```

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