Using the report template with Python

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Using the reticulate package enables Python usage within R and R Markdown documents.

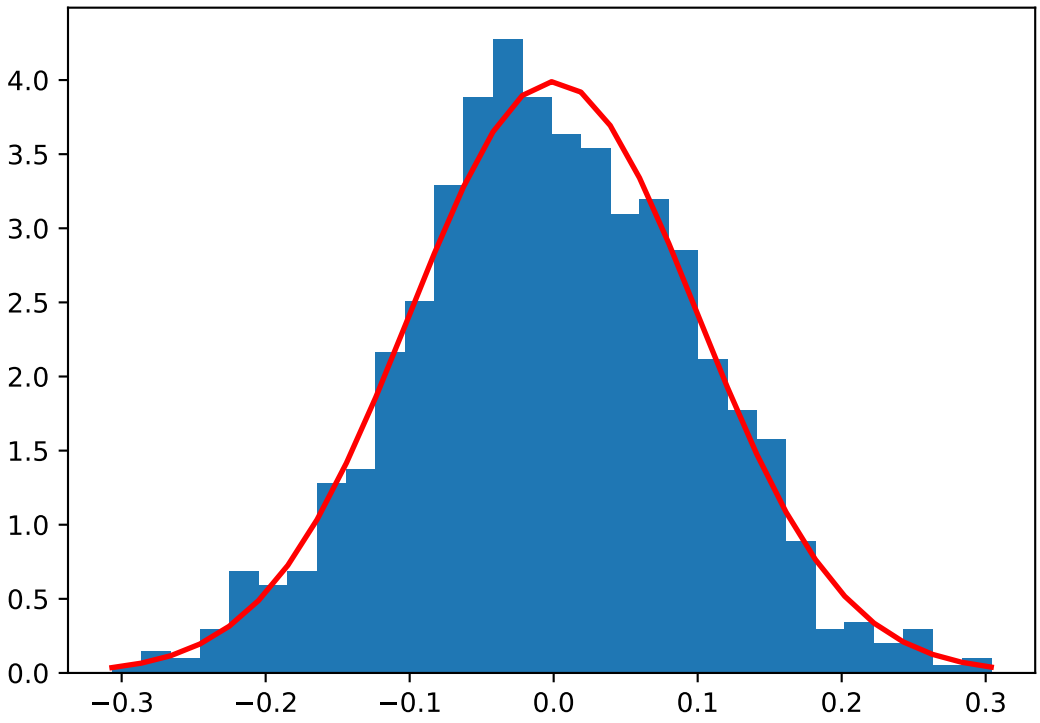
```
library(reticulate)
```

For example, let's generate some random numbers from the Normal distribution with mean μ and standard deviation σ which has the following probability density function:

$$f(x \mid \mu, \sigma^2) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

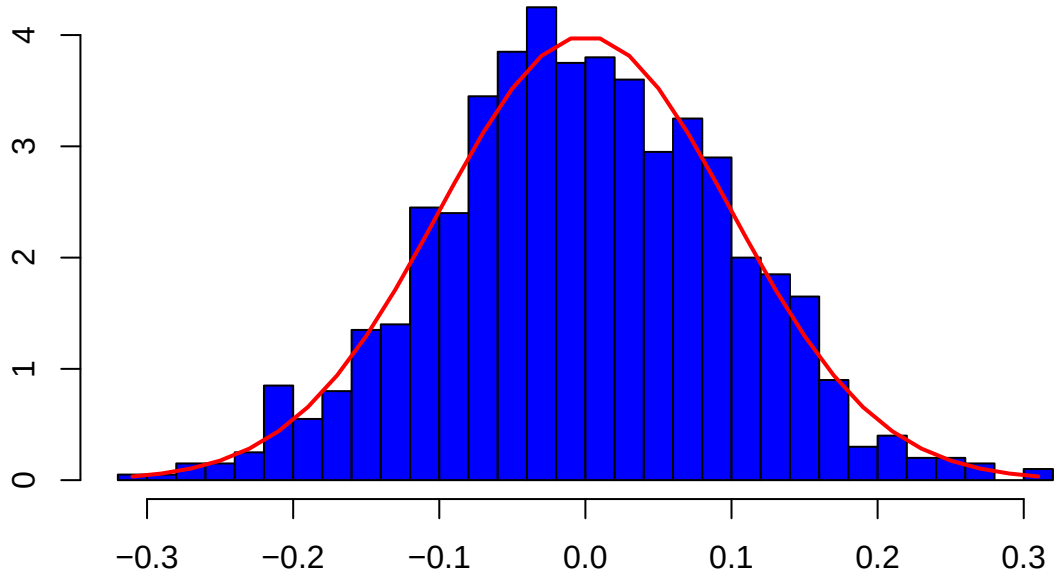
```
import numpy as np

mu, sigma = 0, 0.1 # mean and standard deviation
s = np.random.normal(mu, sigma, 1000)
```

```
import matplotlib
import matplotlib.pyplot as plt

if matplotlib.__version__ < '2.0.0':
  count, bins, ignored = plt.hist(s, 30, normed=True)
else:
  count, bins, ignored = plt.hist(s, 30, density=True)

plt.plot(bins, 1/(sigma * np.sqrt(2 * np.pi)) *
               np.exp( - (bins - mu)**2 / (2 * sigma**2) ),
         linewidth=2, color='r')
plt.show()
```



We can also visualize it in R via the exported py object:

```
bins <- hist(py$s, col = "blue", breaks = 30, freq = FALSE,
             main = NULL, xlab = NULL, ylab = NULL)
lines(bins$mids, dnorm(bins$mids, py$mu, py$sigma), col = "red", lwd = 2)
```



Note: likewise data from R can be accessed in Python using the exported `r` object.

See this article for more information on using Python in R Markdown.

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