

Invalid Date

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1 !

— R Python.
, , .

1.1 ?

- -
 - (VaR, ES, GARCH)
 -
 -
 - R Python
-

1.2

- - ...
-

1 !

1.3

- R / Python
- Quarto
- GitHub Pages
- (Reproducible Research)

1.4

,

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2

3

« »
.
,
:
.

3.1

— , , 2008 .
20 , .
R 2012 Python 2017 .

3.2

- .
- .
- : Excel, R, Python.
- .
- , .

3.3

- : + (Python R).
- : Jupyter/Colab, RStudio, GitHub.
- :
- : (50%), (40%), (10%).

3.4

1. Python/R: , ,
- 2.
- 3.
4. (AR, MA, ARMA)
5. CAPM -
6. - : VaR, Expected Shortfall, GARCH
7. : ,
8. , - ,

3.5 ?

— , , ,

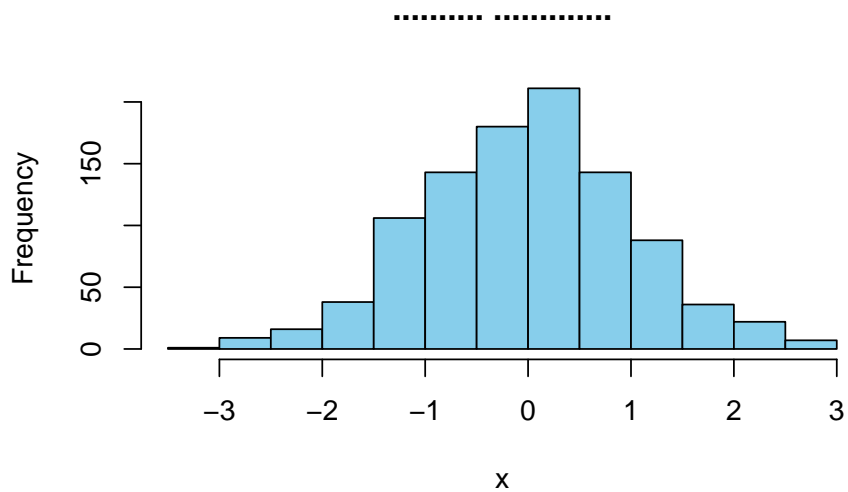
3.6 R Python?

- , — - Data Science.
- :
- :

3.6 R Python?

• — “ ”

```
# R-  
x <- rnorm(1000)  
hist(x, col = "skyblue", main = " ")
```



```
# Python-  
import numpy as np  
import matplotlib.pyplot as plt  
  
x = np.random.normal(size=1000)  
plt.hist(x, bins=30, color="skyblue")  
plt.title(" ")  
plt.show()
```



3.7 Excel, R Python —

Excel . :

- Excel .
- .
- Excel R/Python.

R Python :

-
-
-
- (reproducible research)

3.8 R Python?

	Python	R
	+++ ()	++ ()
/	++ ++ (plotly, matplotlib, seaborn)	++ +++ (ggplot2, plotly)
	+++ (1 TIOBE Index)	++ (18)

Python , . R —

3.9 ?

Matlab, Stata, SPSS, EViews — , .
 , R Python .

, , .

