

# Computational Finance

Exercises for participants of all programs

## Introduction (2 Bonuspoints)

Download the Python-Introduction.py from the OLAT. Please replace all ??? within the Python-Introduction.py with your solutions.

*Useful tutorials:*

<https://docs.python.org/3/tutorial/index.html>

<https://docs.scipy.org/doc/numpy/user/basics.html>

<https://matplotlib.org/tutorials/introductory/pyplot.html>

*Hint: The Dax time series can be found in the OLAT Material/Homework Sheets folder.*

## C-Exercise 00 (2 Bonuspoints)

Write a Python function

```
bond_value(V0, r, n, M, c)
```

that computes and returns the capital  $V_n$  if an interest of  $r > 0$  has been paid on the initial endowment  $V_0 > 0$  for  $n \in \mathbb{N}$  years. If  $c = 1$ , the variable  $r$  refers to a continuous rate (i.e.,  $V_n = V_0 e^{rn}$ ), and if  $c = 0$ , it refers to a simple rate paid over  $M$  time periods per year (i.e.,  $V_n = V_0(1 + \frac{r}{M})^{(n \cdot M)}$ ). Test your function for

$$V_0 = 1000, \quad r = 0.05, \quad n = 10, \quad M = 4, \quad c = 0.$$

*Useful Python commands:* `if, elif, else, math.exp`

<b>Submit until:</b> 25. April 12:00
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