

# Practices to Price Fluctuations

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## 1 Bootstrap

**Task 1.1** *Let us calculate the bootstrap version of the standardized sample mean for the iid case!*

**Task 1.2** *Let us fit a linear regression to the bivariate stock index logreturn data! Check the confidence interval for the beta coefficient by bootstrap samples!*

**Task 1.3** *Let us use the package boot and the dataset cd4. Give different confidence intervals for the correlation coefficient between the coordinates (based on bootstrap or the normal approximation)!*

**Task 1.4** *Let us simulate data from  $AR(1)$  and  $MA(1)$  processes and estimate the variance of the average (as the estimator of the mean) by iid and block-bootstrap methods! Compare the results for different block sizes. Use the parametric bootstrap as well. Which is the nearest to the actual value?*

**Task 1.5** *Let us analyse the data set rezvar.txt, which consists of the daily closing prices of two stocks. Is there a significant trend? If yes, consider the residuals, which can be considered as being stationary. Apply the block-bootstrap methodology for estimating the variance of the mean as an estimator for the expected value.*