

## Worksheet 10

There is a quiz of basic understanding for lecture 10 on Keats.

- 1) [✱] Plot the efficient frontier for the Markowitz model with UKX data when short selling is not allowed.  
(Solution: see the file `markowitzOptimizeRetNoShortSell.m` in `lecture10.zip`)
  
- 2) [✱] Generate your own version of the plot showing the fit of the jump diffusion model to market prices.  
(Solution: see the file `calibrationExample.m` in `lecture10.zip`)
  
- 3) [✱] The “best fit” depends upon how you measure the error in the fit. Suppose that instead of measure the sum of square errors in the price, you measure the sum of square errors in the implied volatilities. Plot the new “best fit” obtained with this different measure of error.  
(Solution: see the file `calibrateJumpDiffusion2.m` in `lecture10.zip`)
  
- 4) When using the simple Black Scholes Model, it still needs to be calibrated. One choice is to take the mean implied volatility. How can this be interpreted in terms of optimization?
  
- 5) [✱] Complete Bonus Question 2.
  
- 6) [✱✱] Complete Bonus Question 3. Implement a solution in MATLAB.  
(Solution: see the file `computeUtilityByMonteCarlo.m` in `lecture10.zip`)
  
- 7) Generate the plot shown in the slide “The optimal portfolio of strategies”.  
(Solution: see the file `utilityMaximizationExample.m` in `lecture10.zip`)
  
- 8) [✱✱] May 2018, Q4.