

Lab Assignment #6

Due date: 5pm, Wednesday, July 7, 2021.

Work on the following projects, submit your code as **LastName_FirstName_week6_lab.ipynb** format for all the projects in one file with proper comments, docstring, or markdown in the code (for example, # project wk6.x code). All code and output for each problem should be submitted in one notebook file with code been run and output shown clearly and professionally. Please use markdown or docstring to show the question # you are working on clearly. Points will be deducted for not paying attention to the instructions on this.

#wk6.1. ABC Corporation is expected to pay the following dividends over the next four years: \$15.00, \$10.00, \$5.00, and \$2.20. Afterwards, the company pledges to maintain a constant 4 percent growth rate in dividends forever. If the required return on the stock is 10 percent, what is the current share price? Write Python code to solve this problem.

#wk6.2. Suppose you buy a 6 percent coupon bond today for \$1,080. The bond has 10 years to maturity. What rate of return do you expect to earn on your investment?
Two years from now, the YTM on your bond has increased by 2 percent, and you decide to sell. What price will your bond sell for? What is the realized yield on your investment?
Compare this yield to the YTM when you first bought the bond. Why are they different?
Assume interest payments are reinvested at the original YTM.

Write Python code to solve this problem, and explain the difference in YTM and realized yield with Jupyter Markdown.

#wk6.3. A bond with a coupon rate of 8 percent sells at a yield to maturity of 9 percent. If the bond matures in 10 years, what is the duration of the bond? What is the modified duration?
Write Python code to solve this problem.

#wk6.4. Download price data, as long as it's possible, from Yahoo Finance for a few stocks such as DELL, IBM, and MSFT. Then calculate their volatilities over several decades. For example, estimate volatilities for IBM over several five-year periods. What is the trend of the volatility? Demonstrate the trends with time-series plots.

#wk6.5. What is the total risk and market risk for DELL, IBM, GOOG, and C if you are using five-year monthly data? Demonstrate the over time changes with time-series plots.