* 2019-08-04
  + In progress:
    - The fundamental data is updated quarterly, e.g. on datekey/reportperiod 2019-04-25 report earnings of 2019-03-31
    - This creates extra complexity of our quarterly rebalancing as it would introduce look-forward bias when we just rebalance at quarter end – the information we based on is actually available after the quarter end
    - Also we found that some previous earning records are missing from the our data (AMZN 2018 Q3). Have to back fill the gaps:
      * Re-get all fundamental data from Quandl, join with our data
    - Daily price data is ok.
  + Done:
    - Updated price and fundamental data
    - IC functionality: corr between alpha rank vs realized return rank
  + To-do:
    - Check data: use monthly (rank, rebalance) also update mechanism of raw data
    - Improve the rebalance logic to remove the look-forward bias: analyze the distribution of earning report dates, and rebalance after those dates.
  + **Action item:**
    - **Update fundamental data** 
      * **Turns out the data always use month-end date as calendar date. And we adjusted the date to biz date to get the data. This may lead some quarter end data are missing. We changed the code and re-getting all the data now.**
      * **After save the newly refreshed data, have to think about the refresh strategy**
* **2019-09-22**
  + We found that different company has different definitions of quarter-end/fisical year and reporting dates. So it is not realistic to rank their fundamental data on the same date. We decided to take the following approach – At each rebalance date, given a list of universe (SP500), for each company, use their latest record to that date, and then do the cross-sectional ranking (Done)
  + This introduce the need of the “lineup/universe” at each rebalance date (quarter end presumably). Our current sp500 univ data has the date column which indicates the time the universe changes. Hence given a rebalance date, we also need to get the most recent updated universe **no late than** that date (Done)
  + Then we need to update the rankZscore function (Done)
  + In the file generalBackTester.R, since we’ve changed our ranked\_univ function to only one single (rebalance) date, we have to re-write the logic to adapt the new back-testing logic
    - First, we need a series of rebalance dates, we use quarter end dates (3/31,6/30,9/30,12/31) -- Done
    - For the function constructPortQtly, previously we build portfolio along the period in this function. Now since our information are all based on single rebalance date, we need to totally revamp this function – Done
* **2019-11-22**
  + Factor Case Study Framework
    - Historical IC Analysis – pb DONE
      * Need to change to monthly and fwd one month return. Calculate monthly ic and average ic and standard deviation of ic
    - Factor Portfolio Performance Analysis - DONE
  + Factor Momentum – TO DO

• 2020-07-19

* + Add the update of SP all universe to the refresh data given it also only dates back 20 years – Done
  + Add detailed monthly stock level factor zscore and fwd return, analyze timeseries correlation and see if there are sector rotation – Done –
  + need to interpret more from the chart – zscore sector average to see what sector the signal is favoring; add growth/value historical index return and compare to the sector level ICs and SP500 whole universe ICs
  + Add historical market event/ business cycle –TO DO
  + Analyze other factor historical ICs – TO DO