Report: approximately what each of us will work on:

Mainly algorithm:

* Sithum & Will
* Basically explain what the algorithm does, all the code you wrote and why
* How you adjusted your methods based on results and why
* Which data you used to test strategy
* Limitations

Mainly financials:

* Arlene
* Theory: Cointegration vs correlation
* Theory: what is pairs trading, how are pairs chosen and opportunities for arbitrage
* Start thinking about how to succinctly explain our strategy
* Arshaq
* How we used cointegration and correlation to pick a pair (explaining the heat maps, ways we determined cointegration and correlation)
* Adjustments to our strategy to limit exposure to the market (changing the standard deviation limits for taking and exiting a position, etc)
* Start thinking about how to succinctly explain our strategy

Questions for Zach:

* Explain the relevance of order of integration to cointegration and correlation.

Important definitions

* Cointegration

Can take non stationary prices

* Correlation

Background

Nature of the data

Selecting a Pair

* More on cointegration
* Implementation of cointegration tests
* Selecting our stock pair candidates
* Connection between cointegration and correlation

Things to add to report:

1. We decided not to estimate the value of the ETFs based on the value of the underlying stocks because we were unable to find a function that could estimate the ETF value with limited underlying stock information accurately enough (aka with a p value below 0.05). Therefore, there was a too big chance that the estimated ETF price could be a coincidence.

**How did we determine whether a pair moves together?**

* Used cointegration.

* Checked that the stocks were correlated as well to confirm the cointegration (check whether our cointegration result made sense logically)

* If the cointegration p-value was lower than 0.05 and they were correlated, we concluded that the stocks were a pair.

* Heat map:

Map 1: map the correlation between 2 stocks and the strength of the correlation.

Map 2: cointegration (red one). The graph shows the p-value.

Map 3: distance base - showed the variance between pair of stocks for each combination of stocks.

* Most highly cointegrated pair were 2 google stocks. GOOGL and GOOG, but when we ran the back test on those 2 stocks we didn't make profit due to too high fees and we were losing money even without fees.

* IHF (not traded), VGT and IYW

**How did we reduce our exposure to the market?**



**THE ALGORITHM**

General Overview

Changes

Rebalance

Taking a market position

Results