Quantopian Platform

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Python for Finance

- Now that we understand the basics of finance and portfolios, it is time to learn how to use the Quantopian Platform for Algorithmic Trading!

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- This section will cover the following:
    - Review of Quantopian
    - Basic Algorithm Methods
    - Building Trading Algorithms
    - Trading Algorithm Exercise
    - Quantopian Pipelines

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- Before we begin with the more technical topics, let’s go ahead and jump to www.quantopian.com and explore the site a bit!

Quantopian Research Basics

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- To follow along with this lecture, make sure you've created an account on Quantopian!
- We'll start off by using the Research Notebook format, then move on to using the Quantopian IDE.

Quantopian Basic Algorithm Methods

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- Remember that the corresponding code in this notebook will only work inside the Quantopian IDE.
- Let’s begin exploring how to create trading algorithms!

Quantopian Basic Algorithm Methods Part Two

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First Trading Algorithm

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- Let’s now apply what we’ve learned about Quantopian Research and the IDE to create our first Trading Algorithm!
- We will conduct a strategy known as pairs trading.

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- We will implement a simplified approach of this strategy.
- Keep in mind this approach is not something you should trade with!
- Instead we'll be focusing on understanding Quantopian's platform.

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- Make sure to do the additional reading in the resources if you are further interested in Pairs Trading.
- The first part will focus on conducting research, the second part will focus on implementing the strategy!

First Trading Algorithm Part Two

Trading Algorithm Exercise

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- Welcome to your trading algorithm exercise!
- This will be an exercise in using the Quantopian Platform, do not take this as a exercise in learning a real trading strategy!

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- We’re going to have you execute a very basic Bollinger Bands trading strategy!
- Let’s quickly review what Bollinger Bands are (we discussed them previously during the Rolling Mean lectures)

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- Bollinger Bands record bounds above and below the 20 day rolling mean
- Bollinger Bands consist of two bands, an upper and lower bound.

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- The bands are calculated from the 20 day rolling mean and 20 day rolling Standard Deviation.
- 20 Day Mean +/- (2 * 20 Day Std. Dev.)
- We will use these bands and compare them to the current price as a signal.

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- Let’s see a visual representation of the bands...

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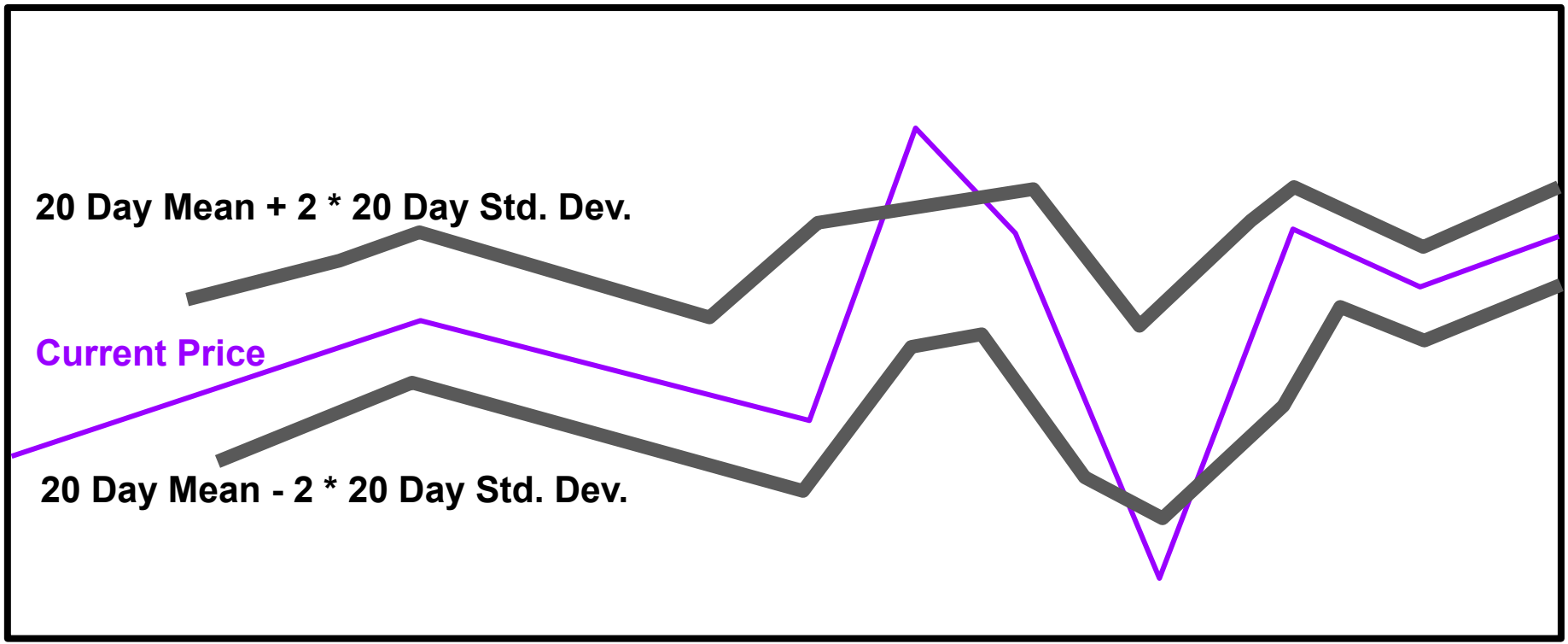

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- We will be implementing an “extreme” version of the Bollinger Band strategy.
- Our basic idea is if the current price is ever above the upper band, we will short the stock. If it is below the lower band, we will go long on the stock.

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- Our version of this strategy is extreme in the sense that we only enter or exit positions based off the bands.
- You may want to play around with exiting off some smaller band off the mean.

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- This strategy is pretty reckless and I would never recommend it to anyone.
- However it is simpler to implement, which is perfect for us to use for practice on the Quantopian platform!

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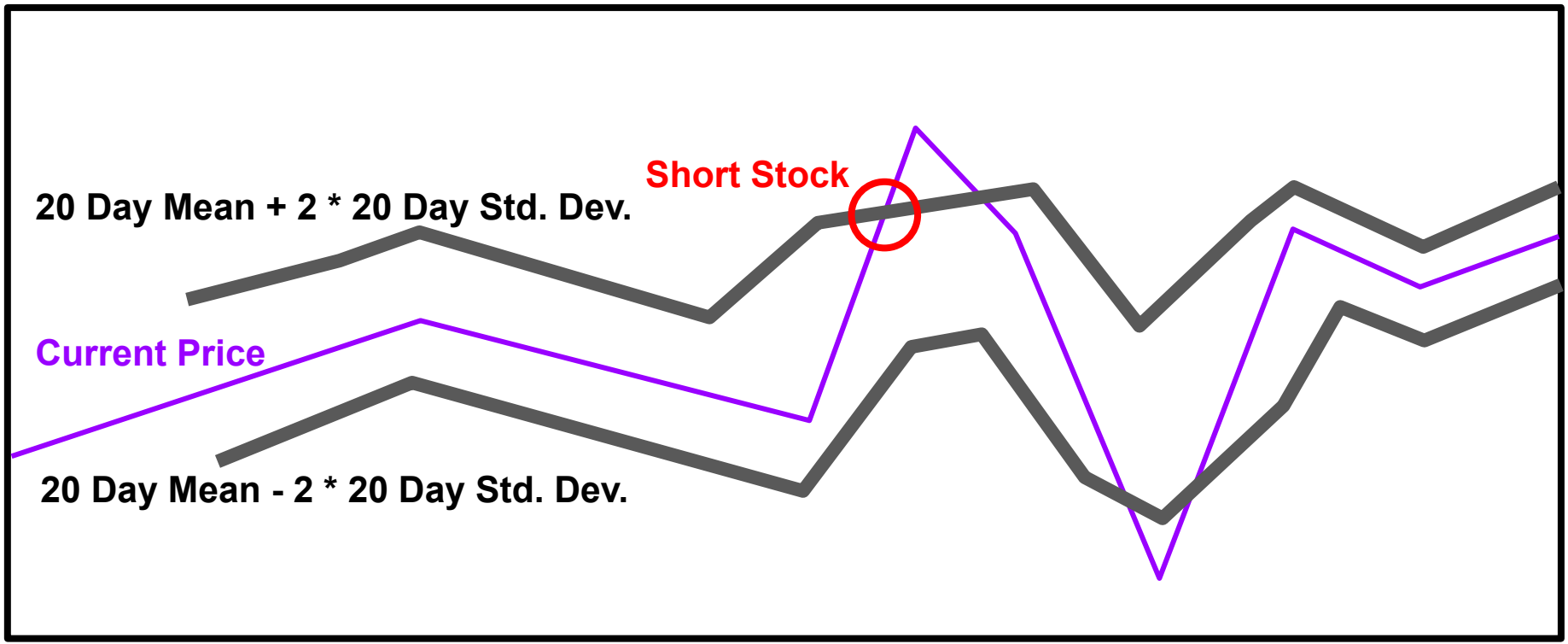
- You will implement this strategy on Johnson & Johnson.
- Let’s quickly review it using the visual representation!

Python for Finance



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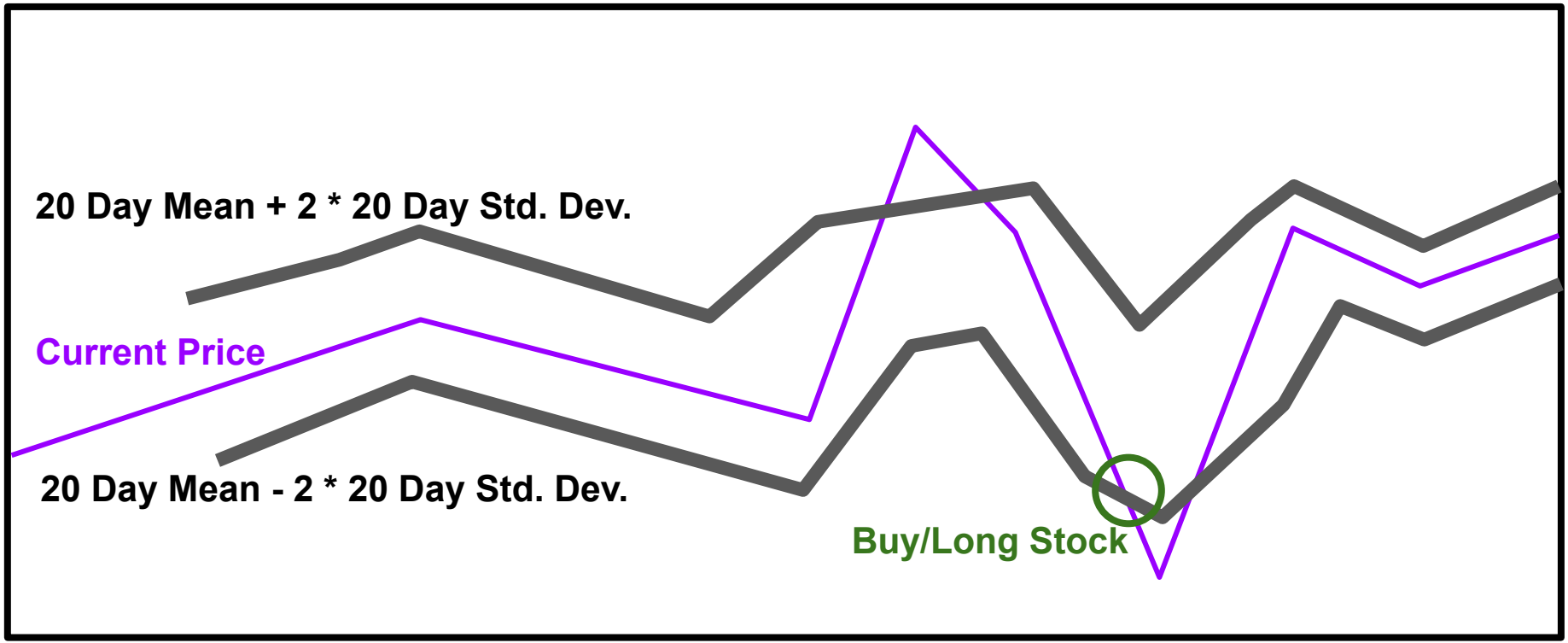

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- You will only check these bands once per day, meaning you will need to use schedule_function().
- Check out the notebook for a full overview.

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- If this seems a bit overwhelming, code along with the solutions lecture first, then go back and see if you can implement it on your own!
- Let’s get started!

Trading Algorithm Exercise Solutions

Quantopian Pipelines

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- Now that we understand the basics of Quantopian Research Notebooks and the IDE let's move on to discuss Pipelines!
- Pipelines are useful for algorithms that follow a set structure...

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- Compute some scalar value for all assets.
- Filter assets based off that scalar value.
- Set desired portfolio weights of filtered assets.
- Place orders on assets to reflect desired portfolio weights.

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- Quantopian Pipelines offer a nice syntax to perform these operations repeatedly!
- We will break up each major step into a separate lecture.
- Take your time with this topic, while the concepts are simple, the syntax can be difficult at first!

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- Remember to reference the notebook in case you need to copy and paste any code into the Research Notebook.
- I recommend you upload the provided notebook to your Quantopian profile to follow along!

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- Let’s get started!

Quantopian Pipelines Classifiers and Factors

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- Let’s begin using Pipelines by discussing a few key parts:
    - Classifiers
    - Factors

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- Classifier is a function that transforms the input of an asset and a timestamp to a categorical output (such as taking in AAPL and 2017 and reporting back that it belongs to the Tech Sector).

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- A factor is a function that takes in an asset and a timestamp and returns a numerical value, such as the 10-day moving average.

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- In this lecture we will create a Pipeline that returns back all equities available at some timestamp.
- Then we will use the USEquityPricing dataset to match up prices to those sids.

Python for Finance

- Then we can create a Factor that will compute some numerical value given the pricing information.
- A lot of these functions will be imported from built-in Quantopian Pipeline libraries!

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- Let’s see how these concepts fit in with the Pipeline Operator in Quantopian!
- Let’s jump to a new research notebook!

Quantopian Pipelines Filters and Screens

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- Let’s continue learning about Pipelines by discussing Filters and Screens.
- Filters take in an asset and a timestamp and return a Boolean.
- Screens then allow you to execute those filters in your pipeline.

Quantopian Pipelines Masking and Classifiers

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- Masking allows us to tell our pipeline to ignore assets all together, before the factors or filters even really take place.
- We can pass in the mask parameter to both factors and filters.

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- Classifiers take in an asset and a timestamp and return a categorical value, such as a sector or an exchange.
- Let’s see a few quick examples of both masking and classifiers!

Course Overview

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- Welcome to the course!
- In this lecture we will quickly cover some FAQs and what to expect during the course!
- Please don’t skip this lecture! It will help you understand the course!

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- Let’s discuss a few things that will help give you the best course experience possible!
- Lectures can be speed up to your liking up to 2x and they can also be viewed at higher quality, click on the settings icon.

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- Who is this course for and what does it cover?
    - Some experience with programming.
    - Interested in using Python for Finance and Algorithmic Trading!

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- If you are interested in just general Data Science and Machine Learning with Python, check out my other course:
    - “ Python for Data Science and Machine Learning Bootcamp ”

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- This course is ideal for students who have some Python knowledge and are interested in Finance Topics.
- A few more things before we get started!

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- This course uses Anaconda and the Jupyter Notebook system.
- If you have your own preferences and are a more advanced user of Python, please feel free to choose any environment you prefer!

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- The course notes have been provided as a .zip file containing all the .ipynb notebooks used during the course.
- You can easily use the nbconvert library to convert them to a variety of formats.

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- The slides shown in the course are also linked to as a resource in their respective lecture.
- They are hosted as Google Slides you can just visit online to see any updates.

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- How to get help during the course:
    - Double check that your code matches the notebooks **exactly!**
    - The code provided in the notebooks is **guaranteed** to work if you are using the provided environment file!

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- Please make sure to run the provided notebooks first before posting a question, it will save you a lot of time!
- Still have a question, no problem!
- Post questions to the Q&A forums inside the course.

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- Please remember to give as much detail as possible, including what you've tried and what resources or links you've already seen.
- Remember to search the Q&A forums for previous similar questions!

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- After completing the course you will receive the ability to get a certificate of completion.
- If you have any issues regarding this certificate, please contact:
    - support@udemy.com

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- If you are experiencing technical platform issues (slow video playback, weird site bugs, etc...) please contact:
    - support@udemy.com