**Trading Strategy Instructions**

**Goal:** To build moving average strategy in **Python** that uses **Quandl** API to extract daily market data and **Interactive Brokers** (IB) API to execute orders.

**1)** Write a Python script that maps the attached contracts.csv file to Interactive Brokers (IB) API for order execution. This should be built to handle any number of contracts specified. First, you will need to download Trader Workstation and the IB API (Stable version). Then you can login to my paper account using the following credentials: username = xxxx, password = xxxxx.

Trader Workstation can be downloaded here: <https://www.interactivebrokers.com/en/index.php?f=16042>

IB API can be downloaded here: [http://interactivebrokers.github.io/#](http://interactivebrokers.github.io/)

Please refer to the IB API guide for details: <http://interactivebrokers.github.io/tws-api/orders.html>

**NOTE:** It is recommended that you use the following resource: <https://www.backtrader.com/docu/order-creation-execution/order-creation-execution.html>

If you know of a better way to integrate execution code to IB API, we are open to suggestions. However, this resource should be strongly considered and can potentially save you many hours.

**2a)** Build a moving average strategy that tests a 5-day and 20-day moving average crossover.  The strategy should go long (or exit short position) when the 5-day moving average crosses above the 20-day moving average and short (or exit long position) when the 5-day moving average crosses below the 20-day moving average. Back-test code is provided in attachment, but you will need to build production code.

Strategy will run exactly once each morning, and moving averages will update each day. However, it should be designed to run autonomously so the strategy can remember where it left off each time it runs.

The key is to keep track of open positions before executing orders so the strategy will remember to close positions in subsequent trades. One of the following can be done:

* Build separate containers/objects that store info for each open contract.
* Construct binary flag that identifies open contracts.

Note: The attached code also includes the **Quandl** API key that extracts market data. Google (GOOGL), Facebook (FB), and Amazon (AMZN) are selected as a starting point. However, the strategy should apply to any number of instruments selected (like the back-test code).

See the following website for further explanation of strategy: <https://www.learndatasci.com/tutorials/python-finance-part-3-moving-average-trading-strategy/>

2b) Move the MA strategy to a more sophisticated ML/DL based model and perform feature engineering, segmentation and back-testing

**3)** Signals from part 2) should then feed **IB execution** API in step 1).