Wolf of Wall Street Montreal
Using financial market data to build and test automated trading strategies
Art of the Possible Conference @ Nexus 2019, at the University of Manitoba
Presented by FCL Trade (www.fcltrade.com) and nQube (www.nqube.com)

Short Description: Build and test futures trading strategies, assess and mitigate their risk, and test them on data. Your strategy should work well for at least one futures contract data set. When trading futures contracts you can buy (long position) in hopes that the value of that contract will increase or sell (even if you don’t own, short position) in hopes that the value of that contract will decrease. No position need be open if you are waiting for market conditions to become favourable for your strategy.

In addition to futures trading (detailed description and external resources are provided below), you should familiarize yourself with backtesting: (https://www.investopedia.com/terms/b/backtesting.asp) and cross-validation: (https://towardsdatascience.com/cross-validation-70289113a072)

Goal: Make the most money while properly mitigating risk. In other words, maximize overall profitability while minimizing the magnitude of consecutive losses (drawdowns).

Data: Provided data sets are based on Montreal Exchange and Canadian Securities Exchange historical market activity. This market data is provided as 1-minute bars (and in terms of price, open, high, low, close) for all products:

CGB: Ten-Year Government of Canada Bond Futures
BAX: Three-month Canadian Bankers’ Acceptance Futures
SXF: S&P/TSX 60 Index Standard Futures
CURA: Curaleaf Holdings Inc. Subordinate Shares

You will be given a large training data set for each product, and one test data set. **You should not train on the test data set.** The test data set should be used to present your results to the judges. The judges will test your strategy on an additional test data set that you haven’t seen before.

The data will be available at the following link starting on October 23rd, 2019:

https://drive.google.com/open?id=1KglyGKDewlDWAcT79P9zzTliXVHYIstV

Language: Any. All external packages, and anything required to run your code should be provided to the reviewers.

Prizes:
1st Prize: $1000, and 5% profit share for 6 months if the strategy is viable and traded live on the Montreal Exchange.
2nd Prize: $500, and 5% profit share for 3 months if the strategy is viable and traded live on the Montreal Exchange.

3rd Prize: $300, and 5% profit share for 1 month if the strategy is viable and traded live on the Montreal Exchange.

Consolation Prizes: If the judging criteria is not met, but an entry exhibits a creative and promising approach, consolation prizes for the best submissions will be awarded at the judge’s discretion.

Judging Criteria: Please submit all of your code, including any external packages required to make it run, to the judges at the contact email below. In addition to this, a poster presentation should be created that addresses the following:

1. Strategy performance – Describe your strategy (mathematically if possible). How does it perform on the data that has been provided to you for training? How does it perform on the test data set. **How much money did you make?** Describe how you evaluated its performance through programming. Did you use backtesting? Did you use cross-validation (cross validation is extremely important in assessing strategy performance).

2. Risk mitigation - How do you assess risk? Is your strategy risky? How does it perform in different risk mitigation scenarios? What are your drawdowns? Do you have a stop loss and take profit programmed into your strategy?

3. Quality of backtesting and cross-validation - Are you sure you didn't cheat? That is, when cross-validating are you sure your strategy couldn’t “see” the next bar? What measures did you take to ensure your code couldn’t see the next bar?

In order to be deemed a viable entry your code must work, and it must perform the functions outlined in your strategy description. It also must make a profit on the test data set without cheating (accidentally or intentionally).

Contact: Please submit entries to the following email. Also, if you have questions or are having trouble accessing the data, feel free to reach out. You will receive a confirmation email when your entry is received.

Jacco Kooij:  jkooij@nqube.com.

Right to use: By submitting an entry into this contest, the participants grant free license to FCL Trade and nQube to perpetually use, modify and duplicate the submitted trading strategy and related material.

Detailed Description

What is a Futures Contract (from www.investopedia.com)?
Futures are derivative financial contracts that obligate the parties to transact an asset at a predetermined future date and price. Here, the buyer must purchase or the seller must sell the underlying asset at the set price, regardless of the current market price at the expiration date. Underlying assets include physical commodities or other financial instruments. Futures contracts detail the quantity of the underlying asset and are standardized to facilitate trading on a futures exchange. Futures can be used for hedging or trade speculation.

The futures markets typically use high leverage. Leverage means that the trader does not need to put up 100% of the contract's value amount when entering into a trade. Instead, the broker would require an initial margin amount, which consists of a fraction of the total contract value. The amount held by the broker can vary depending on the size of the contract, the creditworthiness of the investor, and the broker's terms and conditions.

**How to make money trading futures contracts, or, futures speculation (from www.investopedia.com)**

A futures contract allows a trader to speculate on the direction of movement of a commodity's price.

If a trader bought a futures contract and the price of the commodity rose and was trading above the original contract price at expiration, then they would have a profit. Before expiration, the buy trade—long position—would be offset or unwound with a sell trade for the same amount at the current price effectively closing the long position. The difference between the prices of the two contracts would be cash settled in the investor's brokerage account, and no physical product will change hands. However, the trader could also lose if the commodity's price was lower than the purchase price specified in the futures contract. Speculators can also take a short or sell speculative position if they predict the price of the underlying asset will fall. If the price does decline, the trader will take an offsetting position to close the contract. Again, the net difference would be settled at the expiration of the contract. An investor would realize a gain if the underlying asset's price was below the contract price and a loss if the current price was above the contract price.

It's important to note that trading on margin allows for a much larger position than the amount held by the brokerage account. As a result, margin investing can amplify gains, but it can also magnify losses. Imagine a trader who has a $5,000 broker account balance and is in a trade for a $50,000 position in crude oil. Should the price of oil move against their trade, they can incur losses that far exceed the account's $5,000 initial margin amount. In this case, the broker would make a margin call requiring additional funds be deposited to cover the market losses.

**To simplify:** If your predictive strategy tells you the price of your contract will go up – buy/long position, if your strategy tells you the price will go down – sell/short position.

**Suggested Approach**
You are free to approach this contest however you please and we encourage creative ideas. However, financial trading can seem complicated to those without experience. Here is a suggested approach to help you get started (if you need it):

**Step 1:** Do some reading about futures trading and how it works. If you have questions, feel free to reach out to our trading expert at the contact email above.

**Step 2:** Download the data and look at it. Understand the different prices (open, high, low, close).

**Step 3:** Write some code to import the data into your programming environment. Plot it to see the price movements over time and better understand the behavior of that product. You might want to plot the open, high, low, and close prices on the same plot in order to understand how they change in time, and how the relate to each other on a given bar.

**Step 4:** Design and code strategies to profit on the changes in price.

**Step 5:** Backtest your strategy. Train it on the training data sets provided.

**Step 6:** Cross-validate your strategy. Train it on the training data, and then validate its performance on the test data. Note: it’s very important that your strategy can’t see the next bar when deciding what position to take (long, short, do nothing).

**Step 7:** Try different strategy variations and different products/data to make the largest profit while mitigating risk.

**External Resources:**

Canadian Exchanges Website, includes detailed information on some of the products being traded: https://tmx.com/

Canadian Securities Exchange Website, includes detailed information on some of the products being traded: www.thecse.com

Investopedia, information on futures contracts: https://www.investopedia.com/terms/f/futurescontract.asp

**About nQube**

nQube specializes in designing artificial intelligence-driven software to solve challenging data-modeling and optimization problems in the casino gaming industry and in algorithmic trading.

**About FCL Trade**

FCLTrade is a global private trading and investment company located in Montreal. We provide trading capital, office space, and market access to individual traders and emerging managers.
We trade exchange listed derivatives and equities. We focus on discipline, hard work, and innovation in strategies and products for success.