

Headline: [These skills will help you master algorithmic trading](#)

Source: MoneyControl

Date: 4 February, 2019

These skills will help you master algorithmic trading

A list of skills that are potential algo trader needs to acquire

Moneycontrol Contributor

@moneycontrolcom

Nitesh Khandelwal

As we observed in the [previous article](#) of this series, the global algorithmic trading market is growing rapidly, leading to a rising need for individuals skilled for it. With algorithmic trading contributing a majority of overall trading volume in most geographies, picking these skills



is more important than ever for traders and other financial market participants.

Algorithmic trading has a lot of, might I say 'components' like programming, quantitative analysis techniques, and much more. Some pursue learning in this domain to keep ahead of the times, while others do it for a passion of technology, or to create benefits, upgrade their skills, get their dream job or to simply be future ready.

Giants from the industry - trading firms, brokers, global banks, investment firms, etc. continue to adopt technological advancements. They are always on a lookout to hire individuals who have acquired the relevant skills important in this domain. They need people with algorithmic trading skills. But then, there is the big question - what key algorithmic trading skills would they be looking for?

Here are some vital skills if you aspire to become a part of this domain:

Quantitative skills

Mathematical prowess i.e. the knowledge of statistics, mathematical models, statistical research methods govern your quantitative skills. It doesn't make sense limiting your approach to only number crunching agility. You are expected to know about finding suitable models to define randomness or calculate asset price movements, examine the statistical properties of market data, etc. With the quantity of data available with you, these skills are a weapon in your arsenal constantly firing off and steadily modifying your techniques, programs, strategies and evolving your algorithms in these rapidly moving markets.

Programming knowledge

Coding or programming is another key skill that is very much essential to pick in order to become a successful algorithmic trader. Contrary to popular belief, programming is not just a requirement to automate a trading strategy but is also required through most of the trading life cycle. An algorithmic and quantitative trader uses programming right from validating the strategy hypothesis, to modelling and from back-testing and optimisation, to execution. With the rise of data sciences, Python has become the world's most popular programming language in 2017-18, including in the financial markets.

Financial markets acumen

Any type of trading methodology needs a clear understanding and knowledge of the financial markets. All the statistical prowess and programming skills are of no use if you don't understand the concepts of financial markets and trading in general. What type of concepts are we talking about here? It requires an understanding of basic terminologies like bid-ask to understanding the fundamental reasons for price movement in stocks or in any asset class that you intend to trade.

Problem-solving capabilities

Trading is the perfect platform to help you put into practice your problem-solving capabilities. It is an important skill that will really benefit you while coming up with the trade ideas, as well as while modelling those ideas. Modelling strategies can be complex at times and strong problem-solving skills help in coming up with intuitive solutions and frameworks.

Data management

Getting access to quality data is important for any kind of trader. While there are ample sources of data available for daily price data, access to historical intraday data can be restricted. It is important to understand the patterns of data from across various markets and exchanges across the globe. One of the most important tasks for a trader/analyst is cleaning the data, structuring it to be uniform with the database (e.g. converting integers, floating decimals, etc.), and then using it to identify patterns, create and optimise strategies. Please do note that while price and volume data has a high prevalence in most trading strategies, there are other data sets that algorithmic traders often manage like the data related to the economy, sentiment, fundamentals, etc.

System architecture

As important as it is to know how to use a trading system, it is also important to know the inside of a trading system. An algorithmic trader needs to know about various components of a trading system including the adaptors, Complex Event Processing (CEP) engine, etc. Further, it is important to know about the infrastructure aspects from both hardware and network perspective. This part is an absolute necessity if one intends to trade HFT strategies. In the case of medium or low-frequency strategies, a basic understanding of these things can work too.

Managing your risks

Risk management is another important component. The strategies will help you make money, but your risk management system is the one that is often responsible for preserving it. In any kind of trading, market risk is something that a trader is trying to mitigate through various means. In the case of automated trading, mitigating operational risk takes the centre-stage. I often tell our EPAT course participants that when you are trading manually, you have a very powerful risk management tool with you, which is common sense. When it comes to a machine, that critical part is missing and you've to take care of that by carefully adding the appropriate risk checks in your strategy and overall code base.

Compliance and regulations

Every country and region has its own set of regulations and compliance requirements that it must adhere to trade in the respective trading destinations. There are rules related to short-selling, co-location, system approvals, etc. that one needs to know about. For example, some exchanges would need the approval to be taken at an overall system level, while in other exchanges (in India as well as few other countries), you need to get approval at each strategy level. Additionally, if you intend to trade/manage other people's money, knowledge of regulations becomes even more critical.

The above list is not comprehensive but still attempts to cover the majority of the skills/factors that are critical to success in an algorithmic trading setup. Even if you don't have all these skills, it doesn't mean that you can't be an algorithmic trader. The idea is to start with a few skills and keep picking and adding the rest to your skill-set over time. More the skills you have in your arsenal, higher the probability of success in this domain.

So, dive right in. #GoAlgo and be a part of this industry.

The author is the co-founder of QuantInsti, an Algorithmic Trading training institute.

This article is part of a series where we will be covering various aspects of Quantitative & Algorithmic Trading, including the strategies across various asset classes, techniques, infrastructure requirements, regulations and skills required in this domain.