Personally, I don’t have the stomach to trade stocks, I am too risk adverse. A friend of mine has the opposite problem, he doesn’t care about risk at all. This is all well and good though since he seems to be great at picking winners in the stock market. His problem is that after the price of the stock balloons, he never sells and misses out on huge gains when it inevitably comes back down. On the rare occasion I do trade and pick a winner, I make sure to sell to secure my profits. This leads me to miss out on money I could have made had I held for longer. This is a problem that can be solved by reinforcement learning (RL).

Reinforcement learning (RL) offers a solution for optimizing trade execution in stocks. Traditional approaches may not do so well with changing conditions, such as the pump and dump stocks my friend seems keen on, but RL algorithms excel at dynamically adjusting order placement and timing to maximize gains. By continuously learning from market data, RL agents can improve execution outcomes by identifying optimal trading parameters in real-time, leading to more efficient trades and thus, more money.

The open-source library FinRl, developed by AI4Finance, offers a way to use reinforcement to execute this idea. FinRL operates through a three-layered structure comprising market environments, agents, and applications. In the context of trading tasks, an agent interacts with a market environment, making sequential decisions. Within the main folder, finrl, there are three subfolders: applications, agents, and meta. A train-test-trade pipeline is employed, utilizing three files: train.py, test.py, and trade.py. Reinforcement learning (RL) is at the core, training agents through trial and error, while deep reinforcement learning (DRL) employs deep neural networks as function approximators. DRL strikes a balance between exploration and exploitation, proving advantageous in automated trading by solving dynamic decision-making problems through interactions with an unknown environment. Automated trading involves complex decisions regarding where to trade, at what price, and in what quantity. DRL trading agents leverage multiple financial factors to construct a multi-factor model, providing algorithmic trading strategies that should in theory beat out the behavior of both my friend and myself.