MoneyManager V0.1

- IBM, GS, MSFT. Minute data 2019
- We focus on models that predict if the value of a stock will be bigger **exactly** 20 minutes from now and build a strategy from there.
- No slippage, no comision yet :(

Strategy

- We use three models (IBM, GS, MSFT)
- Each model predicts whether the value of the stock will be higher or not exactly 20 minutes from now.
- Why this target? Why exactly? Why three stocks?

The Algorithm:

(1) Start by buying an asset at random

(2) If a model predicts that a stock is going up, sell our current position and buy the suggested one, hold it for at least 20 minutes. If at some moment we predict several stocks are going up, pick one at random. Keep repeating (2)

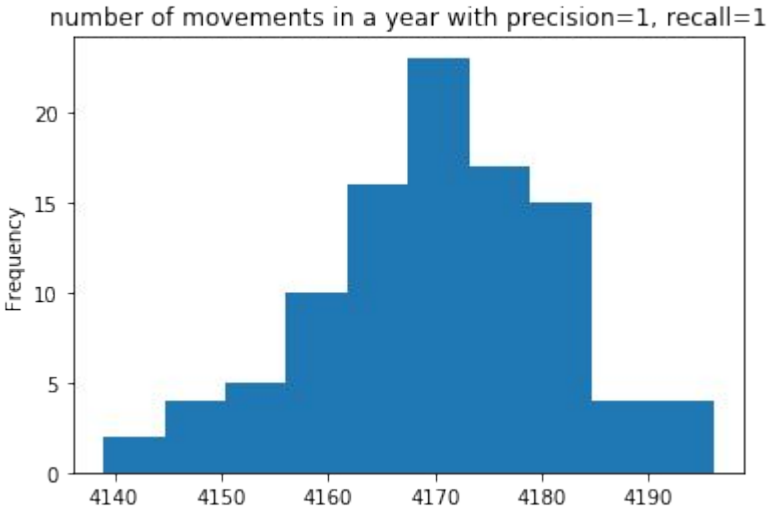
Unrealistic scenario

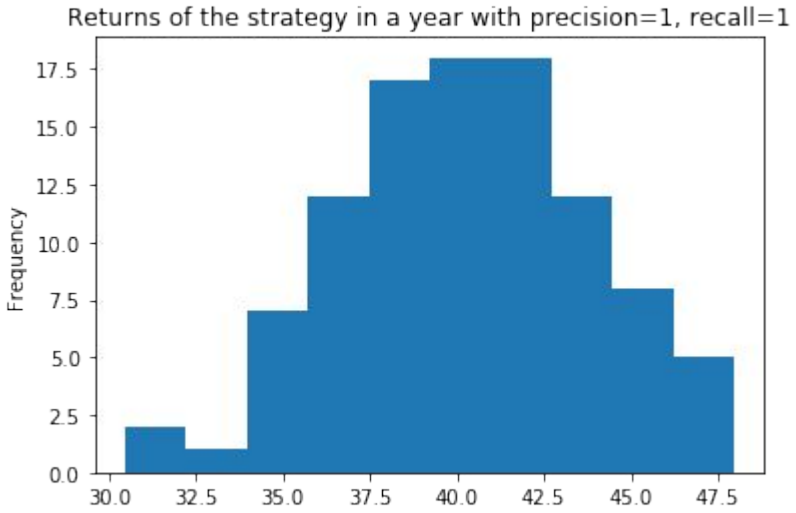
Minute by minute our models would make (perfect) predictions and we will keep buying and selling accordingly. Imagine that we always know the right asset to keep

Time (min)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	...
Model Suggestion	I	I	G	G	G	G	G	G	M	M	M	I	I	I	...

Spoiler alert: we would make huge amounts of money; this would require around 4100 movements per year and will multiply the initial amount by 40.

Unrealistic performance (2019)





A more realistic scenario

The predictions of our models can be noisy in two ways:

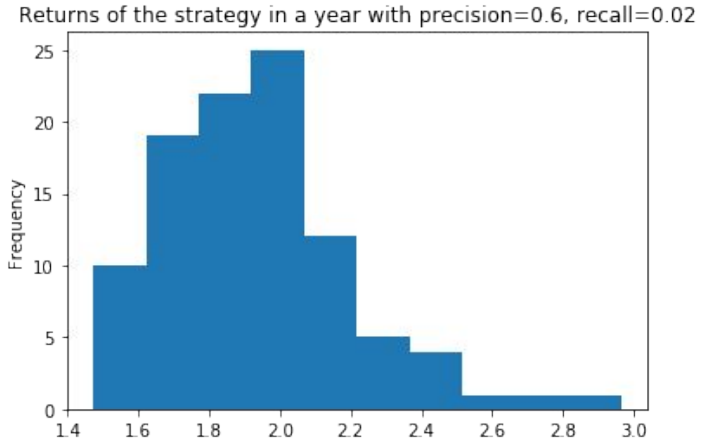
(1) They are sparse; often we might not even have a prediction.
(2) When they suggest something, they will often be wrong.

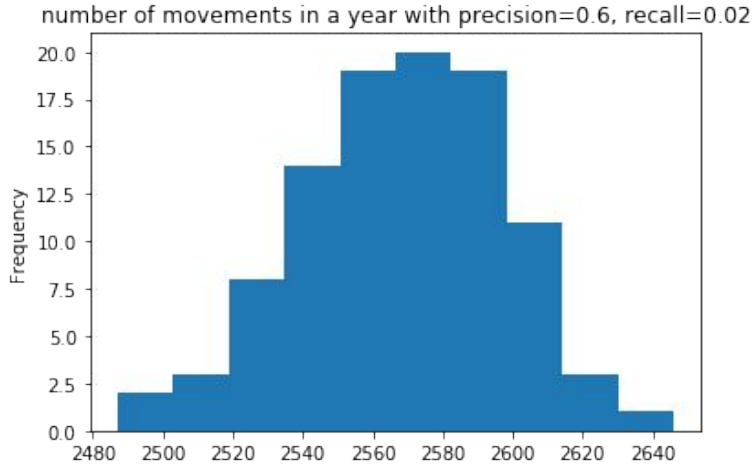
Instead, of the previous chart, we might have something like:

Time (min)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	...
Model Suggestion	I	~~(I)~~M	~~(G)~~	~~(G)~~	~~(G)~~	G	~~(G)~~I	G	M	~~(M)~~	~~(M)~~	~~(I)~~	~~(I)~~	I	...

The question is, how bad can our models be, so we can still make money?

A more realistic performance (2019)





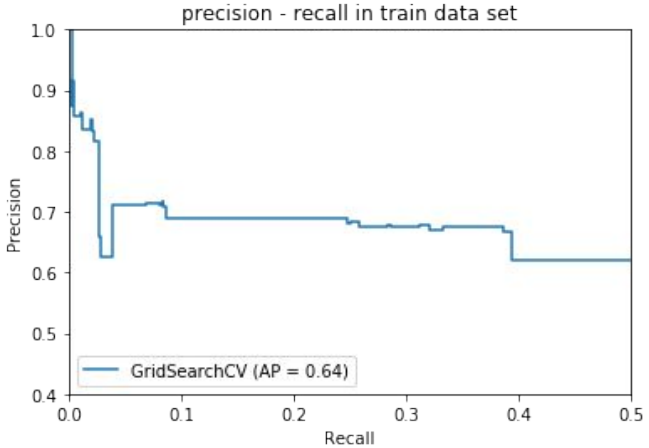
Notes:

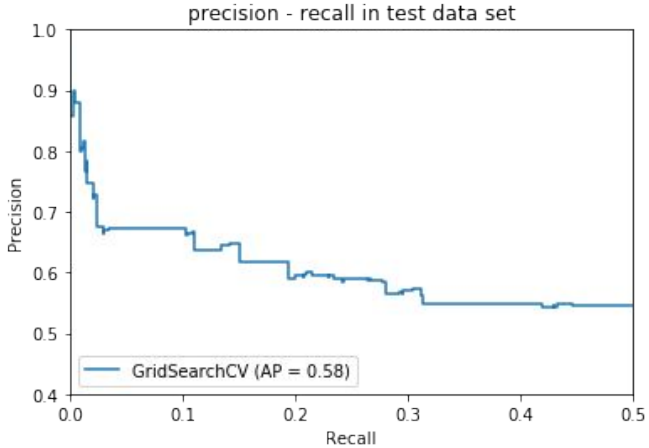
- winGS=1.42, winIBM=1.25, winMSFT=1.6
- 1 movement = (1 sell + 1 buy)
- 2500 movements ≈ 10 movements per day

What's the problem then?

Models overfit easily, detecting 'good models' automatically is hard (work on progress), but I think it's possible. The following pictures are the best I have seen so far but 'good-enough' models appear often.

Correlations in the outputs of the models will be problematic. Models producing buy-suggestions that are concentrated on time will also bring problems.





Takeouts

- Low-performing models are enough as long the overfit is small.
- More concretely: 3 models with 60% precision and 2% recall will be enough to outperform the 3 chosen assets.
- There is still a huge margin of error. If it was the case that we cannot reach 2% recall, we could add stocks to the mix and the strategy will still work *‘mutatis mutandis’*