Plan of action

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3 IT Factory
Artificial intelligence

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1 Brainjar

Brainjar is a rather small company that primarily focuses on the development of end-to-end machine learning applications and AI consulting.

Brainjar is part of the Raccoons group along with a series of other businesses. The Raccoons group falls under the Cronos group.

At Brainjar, it is the employees who make the company unique. Because of their limited staff, each employee has extensive knowledge across multiple domains.

2 Subject internship

Originally, I applied to Brainjar, for another internship regarding explainable AI. However, after discussing my (shared) personal interests, a different suggestion was made. Why not try to create a model that may guide investors and traders?

2.1 Objective

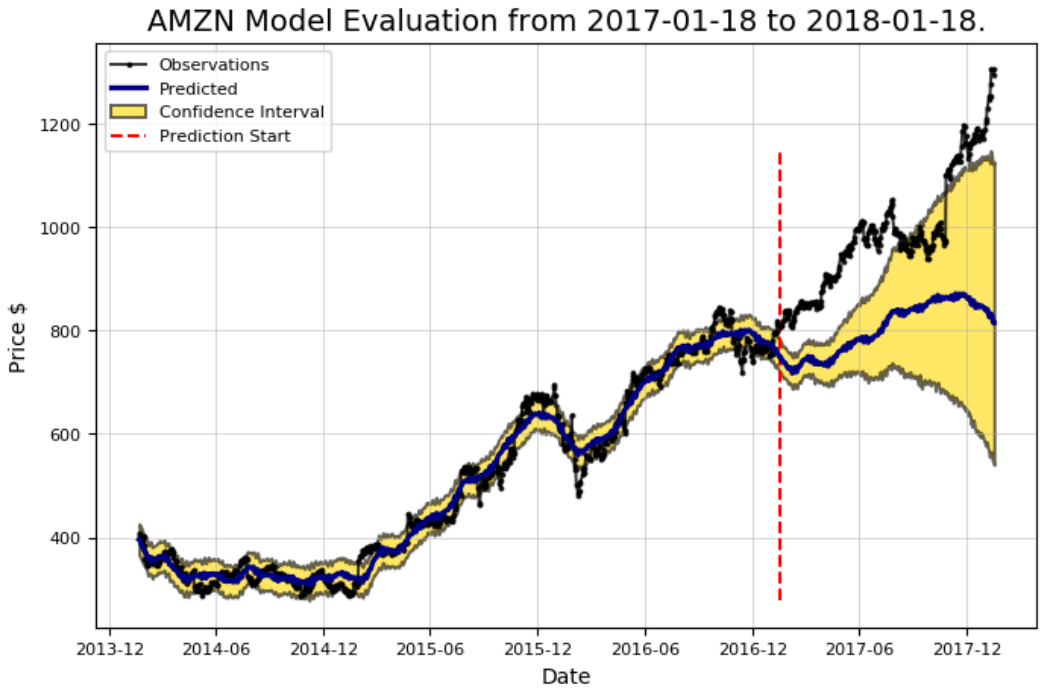
My internship assignment can be divided into 3 sections;

- Programming a deep learning model that has notion of market sentiment and instrument value.
- To visualize the difference in quality between human speculation and that of a computer.
- Possibly do something around explainable artificial intelligence.

2.1.1 Algorithm

A model has to be established, that analyzes the available history of an instrument and makes predications regarding the further value of the instrument.

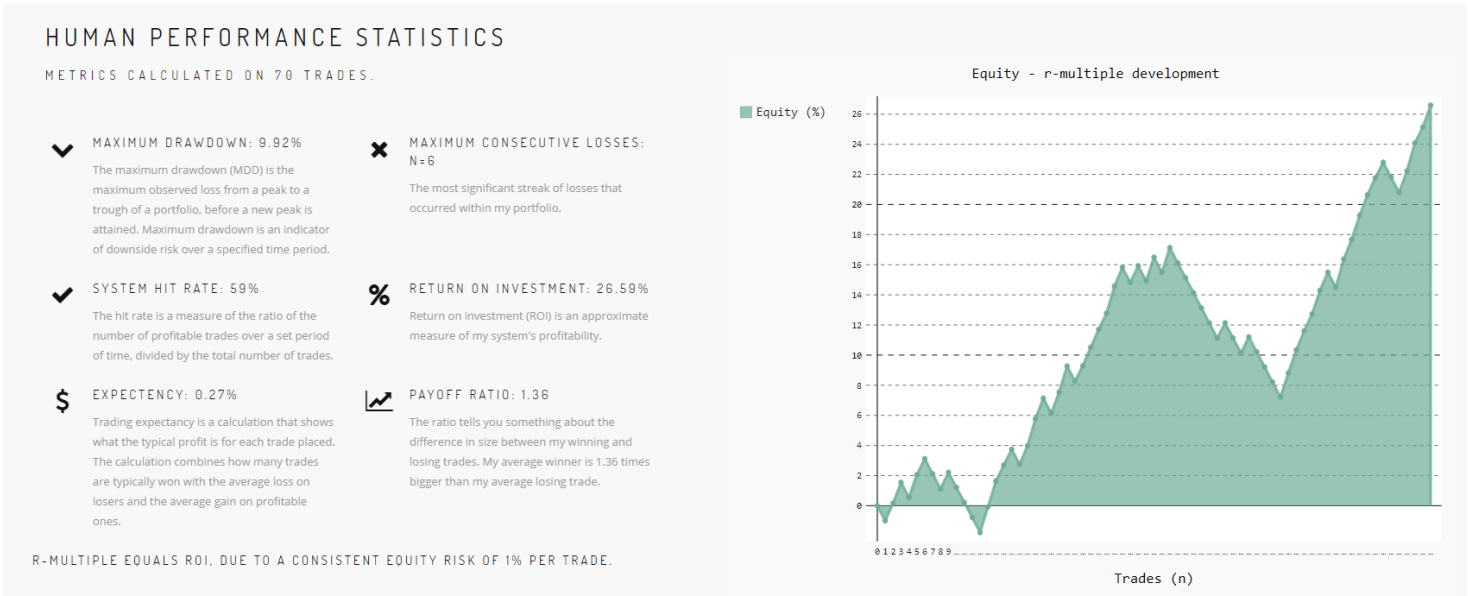
By value forecasting we think of high and low prices during a given future interval being input dependent.



When evaluating the model, the following should be considered; the unpredictability of the market at a micro level and simultaneously the predictability of the market at a macro level.

2.1.2 Speculation quality

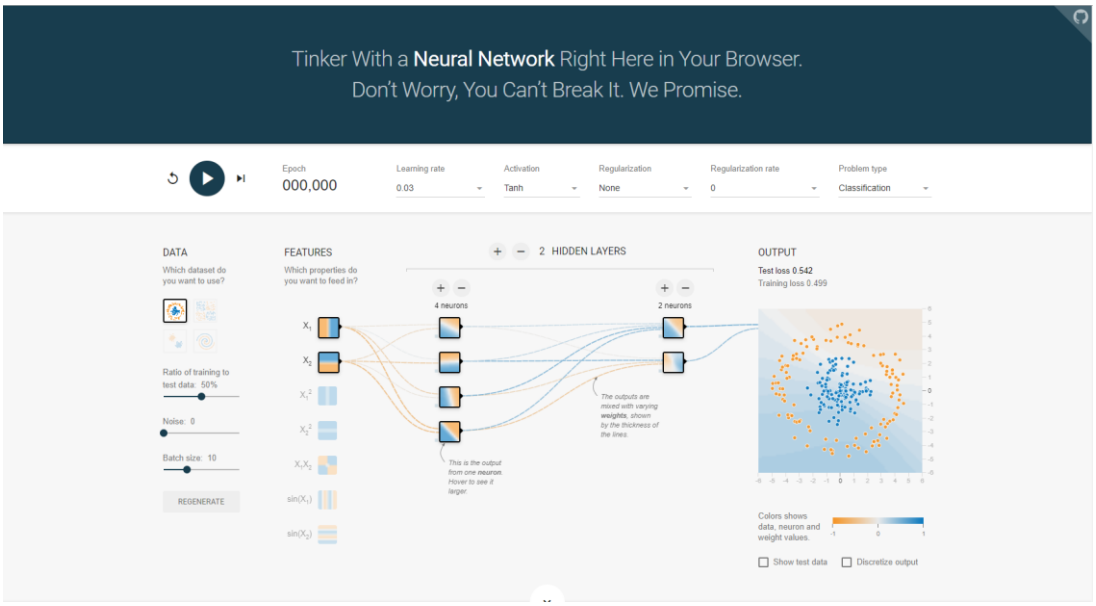
The aim is to use artificial intelligence to obtain better results by using a more data-driven approach rather than relying only on a technical one. Due to the fact that the human brain can process far fewer variables at any given time than a computer, it should theoretically deliver better results.



2.1.3 Explainable AI

From within the company itself, I was also approached to possibly do something around explainable artificial intelligence. This was actually the assignment I originally applied for. As it turns out, clients often find it difficult to imagine how certain decisions are made by their model.

I intend to make a similar implementation to the playground of TensorFlow.



3 Approach

3.1 Data

Just about every project that involves artificial intelligence in one way or another starts with analyzing data. I plan to look first at the extent to which I can use my own data to make the project successful, due to the fact that there are a tremendous number of restrictions around financial data.

However, using proprietary data has a detrimental effect on scalability. The data I feed to my model should be accessible to everyone. It's obviously going to be a tradeoff between the previous options discussed.

3.2 Usage

Coming up next, it is very important to think about how one would like my model to be deployed. Should the algorithm be able to make meaningful predictions on either futures, spot or options?

I personally think options are the most obvious choice. This way I'm able to focus on sentiment and direction without paying too much attention to risk analysis, since the premium is the maximum risk for an option trader. Fewer variables translate into a less complex problem.

3.3 Technology

To me it seems best to start simple. I plan to start by making a comparison between the basic machine learning algorithms of scikit-learn (knn, regression, …). If such models underperform, I'll switch to deep learning; lstm, xgboost, …

4 Schedule

I decided to adopt an agile working method, where I work with weekly sprints. For my internship, it is also important to be aware of time.

This is because it is a task that you can continue to work on, there will always be room for improvement as you will never be able to successfully predict the price of a financial instrument.

4.1 Initiation phase (w1 – w4)

During the initiation phase one must try to think about the development of the required solution and any kind of problems that may arise. This means that there will be a lot of creative thinking.

4.2 Realization phase (w4 – w11)

During the realization phase, mainly the technical aspect of the internship will be addressed. Here the idea is that I plan weekly sprints in order to improve the quality of my model week by week.

4.3 Assessment phase (w11 – w13)

The last two weeks of my internship are then again dedicated to the reflection, evaluation and finally presentation of my solution.

5 Reporting

At the beginning of my traineeship, it was chosen to rely on daily stand-up meetings with both of my mentors. Brainjar is convinced that in this way problems will drag on less and more progress can be made.

There is also a regular meeting with our internship supervisor from Thomas More (Bram Heyns).

6 Deliverables

When the internship is coming to an end, it is always helpful to know what deliverables are expected and in what shape.

I am supposed to make sure I deliver an algorithm that is sufficiently robust and can be used on different quotes (tickers). It is also very important that the data on which my solution relies is easily available.

Brainjar would like to see everything listed in a portfolio/blog afterwards, which will be written and delivered by me.