**Project Report**

**Project goal:**

The project aims to classify financial time series data and predict stock prices precisely by applying shapeltes methods. The project would started with a single stock or index. I would realize the algorithm in Python and by training the shapelets model with time series data of a particular stock or index, I expect to find a reliable model. Based on the model, I would apply it to other stocks and find a model fits most stocks and indexes. I would also compare the result of Shapelets with other methods, like Dynamic Time Warping, CO-integration, and others, to show the features of shapelets. Besides, for the better use of the model, I would create a simple web apps for financial time series analysis.

**Significance of the problem:**

There are some drawbacks with the common used classification methods in financial industry. Comparing to those classification methods, shapelets can provide interpretable and more accurate results, and reduce the calculation time. The project would based on shapelets methods, aiming to build a model which could give more precise results. The model could fit most stocks and indexes in practical world, so it is feasible and be extended to practical problems. Besides, the project would compare the results of shapelets and other methods, so it would be a good example to show the differences between different methods.

**Problem statement:**

Stock price prediction based on the similarity analysis of financial time series is an old and important problem in financial industry. There have been various methods developed to deal with this problem. However, the performance of these methods are not quite satisfied. In this project, I’d like to adopt some new methods to analyze this problem and try to improve the performance of price prediction. Shapelets have several advantages. Shapelets could provide interpretable results and be more accurate on some datasets. I will use shapelets method to build a more reliable model for financial time series analysis and compare the results with other methods.

**Proposed solutions:**

First I will realize the shapelets model with Python and modify the model with time series data of a particular stock. And extend the model to fit more data sets. By parameter optimization, I could finally find a model could do the similarity analysis presicely.

**Proposed timeline:**

September 15-September 30:

1. Know the purpose and problems need to solve of the project.
2. Write the proposal and planning form.
3. Have a quick review of time series analysis knowledge.

October 1- October 29:

1. Do literature reading to have a deeper understanding about shapelets methods and know how to use shapelets to solve financial problems.
2. Refer to online resources and learn to realize the shapelets models in Python.

October 30- November 26:

1. Simple application of shapelets: apply shapeltes with a single stock data and modify the model.
2. Find some drawbacks of the application and provide ideas for further research.
3. Write the final report.

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Similarity

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