

EE/CprE/SE 492 Biweekly Report 5

October 23 - November 5

sddec18-13: Asset management - Financial Factor Discovery - "Value"

Client: Principal Global Investors

Advisor: Chinmay Hegde

### Team Members

Carter Scheve — *Communications Lead*

Nathan Hanson — *Project Progress Tracker/Manager*

Caleb Utesch — *Meeting Scribe*

Jack Murphy — *Research Analyst*

Samuel Howard — *Lead Engineer*

Alex Mortimer — *Project Manager*

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### Biweekly Summary of Progress

This is the fifth weekly report for our senior design class. Since our last report, in which the data aggregation portion was completed, the model application to the data has been started. We are taking the models we explored last semester and adjusting them to fit the new data with mixed results. Feature selection has also been applied to the new data as well, with differing results. In addition, we have organized our modelling process into a preliminary UML diagram. This shows what components are utilized in our process and how they work together, setting a baseline for the inputs, outputs, and ways of communication between each section. Future teams can certainly use this diagram as a logical starting point to develop similar technologies, which is an overlying goal for our project.

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### Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Carter Scheve	Contributed to and completed midterm presentation for client. Went to Des Moines office and presented our midterm progress. Helped develop parts of the modeling pipeline proposed to the client. In solo work, volatility definition and process were finalized. Volatility calculations were finished and is being used in modeling process. More research into	22	75

	candidate regressors and feature selection techniques to use for for analysis		
Nathan Hanson	Continued analysis, design and development of prediction pipeline. Start to design implementation of concrete classes for pipeline components. Continue documentation for prediction pipeline and its components, as well as instructions for creation of new pipeline components.	16	63
Caleb Utesch	Further worked on development with tree-based feature selection. Have it able to produce subsets of any size with the original stock-level data. Recently started working on getting the algorithm to produce results with the aggregated dataset, and changing NaN replacement method to forward filling, as this is what our client recommended to move forward with.	16	62
Jack Murphy	Continued work on Recursive Feature Elimination. Got a starting subset of features to work with. Working on using the aggregated data to use RFE on the top decile of stocks based on the variance and volatility calculations. Will adjust how the NaN values are replaced in the data as well.	16	66
Samuel Howard	Worked on development of the prediction pipeline. Outlined diagram and started work on interface development. Researched python classes and their construction.	16	66
Alex Mortimer	Presented Midpoint Presentation at client office in Des Moines. Continued refining Random Forest Regression model. Worked toward obtaining legitimate results around 50%. Assisted team in developing the Pipeline diagram that documents our process and the components involved.	21	69

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## **Pending Issues**

- Client still doesn't understand how little time we have remaining to wrap up deliverables
  - Models still are reporting unrealistic values
  - Feature selection processes were being run on stock-level data, but need to be changed to run on aggregated data
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## **Plans for Upcoming Reporting Period**

- Continue refining pipeline combining all parts (data aggregation, feature selection, predictive models, and data reporting)
  - Continue tweaking our models to better fit and use the data to improve results
  - Provide a historical analysis of model and pipeline performance with different settings
  - Start working on final documentation required by the class
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