

Semester Project

CS 637 Time Series and Forecasting, Fall 2021

For our semester together, we will be implementing a semester long individual project. The goal here is to apply our learning in a real-world application to each of your interests.

We will have periodic deliverables to ensure we are on track for an ultimate culmination of a final project deliverable and presentation.

Deliverable #1 – Due Monday 9/13

Defining Your Topic

1. One paragraph on defining your problem
 - a. Which domain does this apply to?
 - b. What are you trying to accomplish?
 - c. Why are you trying to accomplish this goal?
2. One paragraph on defining the dataset
 - a. Where was the data accessed from?
 - b. How many observations and variables does the data include?
 - c. How does the data agree with your solving your problem statement?

Deliverable #2 – Due Monday 10/18

Beginning Analysis

1. Correlation
 - a. Correlogram
 - b. Computation of variance
 - c. Auto correlation
2. Forecasting Strategies
 - a. Address each of the following topics (you do *not* need to implement these if they are not applicable to your project)
 - i. Bass Model
 - ii. Exponential Smoothing
 - iii. Holt-Winters Method
3. Linear Regression
 - a. We are looking for you to implement one (if not multiple) of the types of regression models we discussed in class
 - i. Generalized least squares
 - ii. Linear models with season variables
 - iii. Harmonic seasonal models
 - iv. Log Transform regression
 - v. Non linear model

Deliverable #3 – Due Monday 11/15

Intermediate Analysis

1. Construct a moving average model
 - a. Interpret the model
2. Construct either a season or non-seasonal ARIMA model, based on your data
 - a. Interpret the model
3. Construct a GARCH model
 - a. Interpret the model