**STAT 485 PROJECT PROPOSAL**

**Topic**:

Seasonal Time Series

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**Topic Description:**

Our group will be focusing on the seasonal time series and we will analyze a dataset of the price of Apple products. We are going to do a more theoretical project so we are going to use the data set of apple prices, fit the data, forecast the series and simulate the fitted model.

**Procedures:**

1.We will first visualize the dataset to see if there is seasonality.

2.We will then determine if the seasonal data is deterministic or stochastic.

3.a)If the data is deterministic seasonality, we will check the data and see if the price of apple products follow the same trend yearly so our model will be:

𝑌t = 𝜇t + 𝑋t

𝜇t =𝜇t-12 + for all t

𝑋t  is stationary series with mean 0

b)If the data is seasonality seasonality, then we will use the multiplicative seasonal ARMA model in our project.

4.Using our fitted model to predict the apple prices each month in the following year.

**DataSet Description:**

The dataset that we will use for our project is the prices of apples for each month from 5 places (Moscow, Kaliningrad, Petersburg, Krasnodar, Ekaterinburg) from 2013 to 2016. We will use the data of the Moscow city.

**Reference:**

-Kapatsa, D, 2022, June, Apples: Monthly Prices in Five Cities

[**https://www.kaggle.com/datasets/kapatsa/apple-prices-in-russian-regions?select=apples\_ts.csv**](https://www.kaggle.com/datasets/kapatsa/apple-prices-in-russian-regions?select=apples_ts.csv)