**Data Analytics Laboratory**

**Task 5**

**Time Series Analysis using ARIMA Model**

**Introduction**

* Time series analysis attempts to model the underlying structure of observations taken over time. A time series, denoted , is an ordered sequence of equally spaced values over time.
* A time series can consist of the following components: Trend, Seasonality, Cyclic, Random
* Time series prediction cannot be applied if the dataset is stationary. The dataset is said to be stationary if it falls under the three condition:
  + The expected mean value is constant for all values of t.
  + The variance of Y is also constant.
  + The covariance of and does not depends on time
* To check the stationary, we plot the mean and standard deviation to visually analyze the stationary property of dataset
* A statistical method called Augmented Dickey-Fuller test is also used to check stationary of a dataset.

**Prerequisites**

1. What is moving average? Give an example.

2. What is use of regression analysis?

3. What kind of dataset cannot be time series analysed?

**Exercise**

**Apply ARIMA model for Shampoo sales Dataset and predict the sales for next 2 years.**

**Results**

The program is implemented in python and the output is observed.

**Faculty Signature**