# INTRODUCTION

Cotton is an important agricultural commodity, both domestically and globally. Cotton is produced in four major nations, including India, for around 70% of the world's cotton needs (twenty two percent). In terms of net exports, India is second only to the United States. A net cotton importer in 2001, India was. As a result of the extraordinary progress made by the cotton sector over the past decade, it has become the world's largest cotton exporter today. To make cotton a strong and dominating sector, the National Textile Policy of India (2000) has made major efforts to raise its quality to worldwide standards. When it comes to exporting cotton fiber, the Cotton Textile Export Promotion Council plays a major role. The future of cotton exports is critical to the viability of the cotton market. Many of the forecasting models available in time-series literature may be used to predict the future short-term growth behavior of a set of observations. Using quarterly data from 2009 to 2019 from the Directorate General of Commercial Intelligence & Statistics, we examine the future of Indian cotton export behavior. The Autoregressive Integrated Moving Average (ARIMA) model is used to analyze predicting patterns and behavior. Models based on ARIMA are frequently used in a variety of economic forecasting fields. ARIMA is credited to George E.P. Box and Gwilym M. Jenkins' in 1970. The model's accuracy in short-term forecasting has been shown, however it has a flaw: the number of observations should be at least fifty. Accordingly, this study compares ARIMA model outcomes to SES (Simple Exponential Smoothing) and HES (Holt two-parameter exponential smoothing model).

# PROBLEM STATEMENT

By utilizing the ARIMA model and time series data on cotton exports, an important agricultural product for India, this study aims to generate forecasts. The export council of India's policy debates are heavily influenced by the prediction accuracy. The research compares the accuracy of ARIMA forecasting to other frequently used forecasting approaches. India's economic growth and structural changes need the study of forecasting models in trade and commerce.

# MODELLING

## ARIMA FORECASTING

There's a lot of interest in time series modelling and forecasting, which is used in a variety of everyday situations. During the last decade, a substantial amount of study has been conducted on this issue. To improve the precision and efficacy of time series modelling and forecasting, several important models have been proposed in the literature. Forecasting is the practice of predicting the future based on previous occurrences. Determining how systematically we interpret future events is dependent on how accurate our model specification is in a model specification, dynamic relationships in the past and their link to future variables are statistically formulated. By developing a number of essential models, recent research has improved predicting accuracy. The ARIMA model, or Autoregressive Integrated Moving Average Model, is a stochastic time series model that has been established in the literature. The time series under examination is linear and follows a normal distribution, which is the essential assumption used to construct this model. The ARIMA model has three subclassifications: Autoregressive (AR), Autoregressive Moving Average (ARMA), and Moving Average (MA). Normality is required in order to create an ARIMA model. A model with the fewest number of parameters is chosen to construct an accurate representation for the time series data under consideration, according to the parsimony principle. For optimum model construction in ARIMA, Box Jenkins technique is employed, which has made ARIMA popular. For the ARIMA model, statisticians George Box and Gwilym Jenkins developed an approach that best fits the time series data and also adheres to the parsimony principle. Using a three-step iterative approach, the Box Jenkins technique identifies the best-fit parsimonious model from a class of ARIMA models. In order to forecast the expected future denominations of a sequence of observations, the model must first be fitted to the data set.

## EXPONENTIAL SMOOTHING

In order to forecast a time series, one of the easiest methods is to use an exponential smoothing. According to this concept, the future will be similar to the (recent) past in some way. Only one thing can be learned from demand history, and that is its level. Demand fluctuates throughout time around a certain average level, which is known as a level. When smoothing time series data using the exponential window function, the exponential smoothing rule of thumb is used. In contrast to the ordinary moving average, which weights prior data equally, exponential functions utilize exponentially decreasing weights over time to achieve the same result. As a result, it is a simple technique that may be readily taught and utilized to make various determinations, such as seasonality. Exponential smoothing is commonly employed in time-series data analysis. In signal analysis, exponential smoothing is one of a number of window functions that are used to smooth data and eliminate high-frequency noise. Convolutions were invented by Poisson in the 19th century, and Kolmogorov and Zurbenko used recursive moving averages in the 1940s to study turbulence. Univariate data may be forecasted using exponential smoothing, a time series forecasting technique. For example, the Box-Jenkins ARIMA family of techniques predicts the future based on a linear sum of recent past observations or lags that have been weighted in the model. A prediction is a weighted sum of previous data, and exponential smoothing forecasting approaches are similar, except the model explicitly utilizes exponentially decreasing weights for prior observations.

# Result

Here, we predict the export value of 41 period.