PREDICTION ON RAW MATERIAL USING MACHINE LEARNING

AFFILATION

MRS.DEEPIKA.S[1], MS.HARSHAPRABHA.A[2]
MRS. S. DEEPIKA
ASSISTANT PROFESSOR, DEPARTMENT OF B.COM BUSINESS ANALYTICS
PSGR KRISHNAMMAL COLLEGE FOR WOMEN
deepika@psgrkcw.ac.in
MS.HARSHAPRABHA.A
UG SCHOLAR, B.COM (BUSINESS ANALYTICS),
PSGR KRISHNAMMAL COLLEGE FOR WOMEN
harshaprabha1611@gmail.com

ABSTRACT:

The paper focus on finding required raw materials to meet estimated demand. **Raw material**, is a basic **material** that is used to produce goods. The Raw material has been analyzed and predicted to find the outcome for upcoming years. This prediction shows the increase or decrease in raw material. These raw material attributes have been analyzed through algorithms. The algorithms used are K-Means and Linear Regression.

KEYWORDS: Supply Chain, K-Means, Linear Regression, Prediction

I. INTRODUCTION

Supply chain- network of all the individuals, organizations, resources, activities that creates and sell a product. It links a firm with its customers, suppliers and other members of the supply chain system, including transportation and warehousing companies. Supply chain involves all activities associated with the flow and transformation of goods from the raw materials stage (extraction), through to the end user, as well as the associated information flows[3]. Using Python ,data are analyzed and predicted. Python is high-level artificial language that supports object-oriented programming furthermore as procedural oriented programming. In Python, Jupyter notebook is employed for locating output. Jupyter Notebook is an open-source web application that permits you to form and share documents. It's easy to use and an interactive data science environment. Using k-Means, data are clustered. k-means clustering is one among the tactic of vector quantization that focus in partition n observations into k clusters. After Clustering the information, using regression toward the mean algorithm, dependent and experimental variable found and predicted the output. Regression may be a linear approach to search out the connection between a scalar response. It's the primary variety of multivariate analysis that are used extensively in practical application.

II. REVIEW OF LITERATURE

III.

The management of the supply chain is basically management of the relationships and activities among the members of organisations (system). The goal of supply chain management is for members in the organisations to work together and build a partnership with each other to increase the competitive advantage of the supply chain as a whole[4].

Cassified integration in supply chain context into six different types: customer integration, internal integration, material and service supplier integration, measurement integration, technology and planning integration, and relationship integration. For more than a decade SCM literature has been emphasizing on the importance of SCI among intra or inter-organisation processes[1].

The importance of supply chain integration (SCI) has been acknowledged in the literature. (1998) define. The National Research Council provides a comprehensive definition of SCI as “an association of customers and suppliers who, using management techniques, work together to optimize their collective performance in the creation, distribution, and support of an end product manufacturer”. They also stress that supply chain integration is a continuous process that can be optimized only when original equipment manufacturers (OEMs), customers and suppliers work together to improve their relationships and when all participants are aware of key activities at all levels in the chain. This leads to an important and emerging concept of SCMI that fosters "integration across inter and intra- organisational business functions and processes”[2][5].

IV. METHEDOLOGY

In python, using jupyter notebook, data are implemented and predicted. By using K-means algorithm, data are clustered based on product attribute. K-means, is a type of unsupervised learning. It aims to partition n observations into k clusters. The goal of this algorithm is to find groups in the data. It assumes that the amount of clusters are already known. it's also called flat clustering algorithm. the quantity of clusters identified from data by algorithm is represented by 'K' in K-means.the data points are assigned to a cluster in such a fashion that the sum of the squared distance between the information points and centroid would be minimum. it's to be understood that less variation within the clusters will result in more similar data points within same cluster.It preprocess the data to evaluate results. In this paper, K-Means algorithm helps to cluster the products.

After Clustering the data, using linear regression algorithm, dependent and independent variable found. Using the variable output was predicted. The term "linearity" in algebra refers to a linear relationship between two or more variables. If we draw this relationship during a two dimensional space (between two variables, during this case), we get a line.Linear regression analysis is employed to predict the worth of a variable supported the worth of another variable. Linear regression is like a linear model, that assumes a linear relationship between input variables (x) and output variable (y). It finds a line that best fits the data points available on the plot. It helps to predict value.It is utilized in business to judge trends and make estimates or forecasts. as an example, if a company's sales have increased steadily monthly for the past few years, by conducting a linear analysis on the sales data with monthly sales, the corporate could forecast sales in future months. Linear models are easy to understand to predict value.

V. RESULT

ALGORITHM 1:

K-MEANS

- **ELBOW METHOD GRAPH**

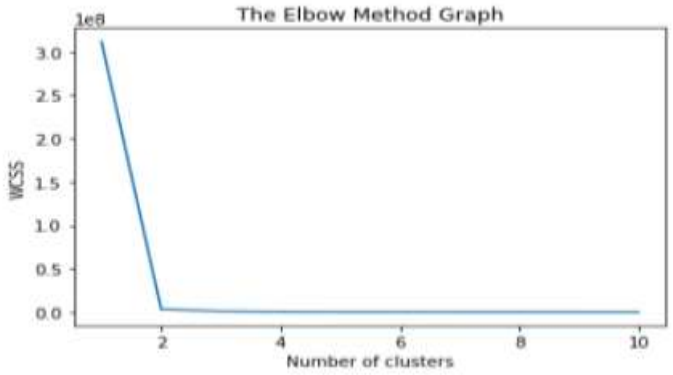

fig.4.1

The above graph method runs K-Means clustering on the dataset for range of values for K. It has fetched and displayed the number of clusters presented. The number of clusters has been shown in the Elbow Method Graph and it has randomly fetched the attributes numbering and have displayed it.

- **SCATTER PLOT**

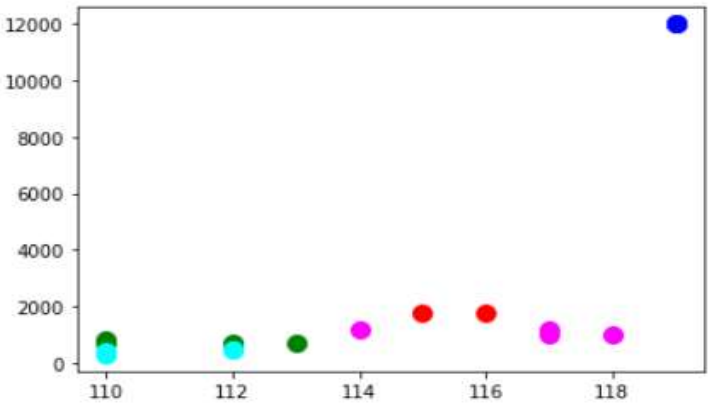

fig.4.2

The above figure graph clustering has been plotted and shown in different colors to differentiate the attributes. The attributes used are expected time and the quantity required for that. It has plotted the similarities between them.

LINEAR REGRESSION

- **KDE GRAPH**

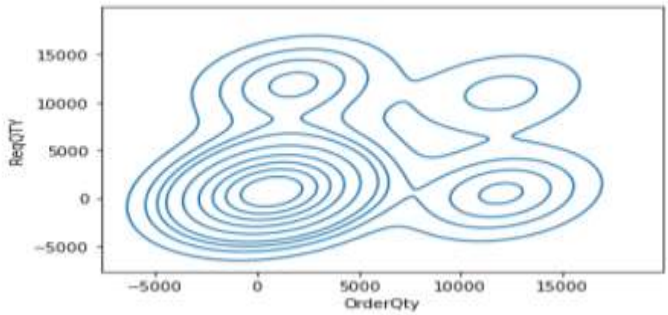

fig.4.3

The above graph depicts required quantity and order quantity has been used for representing the EDE graph. These attributes have been applied to know the relationship between attributes and have been plotted by showing the increase and decrease in the given attributes.

- **BAR GRAPH**

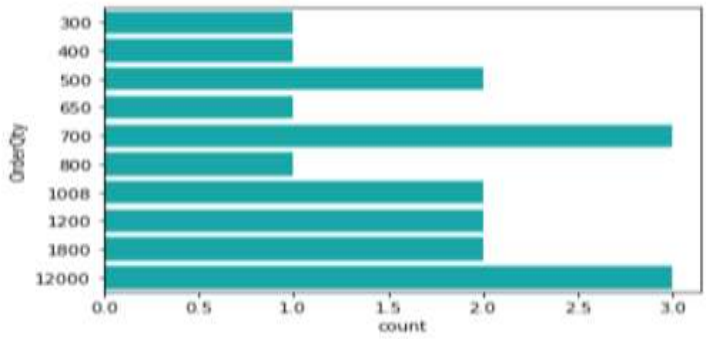

fig.4.4

The above bar graph has been created to know the increase and decrease in the given attribute order quantity it shows the growth or increase or decrease in the order quantity.to predict the coming years.

FINDINGS:

- The prediction is made using the bar plot in linear regression and the range values that might occur have been predicted.
- The value of required quantity has been fluctuating and in the future it might be range from 3.0 to 4.0.

VI. CONCLUSION

The paper investigates the attributes of given concepts to predict the upcoming years and to finds the fluctuation and gives a result for the years.so the attributes were taken accordingly to the concepts and have analyzed and have been predicted to know the outcome of coming years using linear regression.

FURTHER WORK

It helps to find the required rawmaterial for the upcoming year.It is suggested to upgrade the check on raw material using machinated technology more than human involvement.

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