

# **VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**“Jnana Sangama”, Belagavi, Karnataka-590018**



A Mini Project Report on

## **“ SARIMA MODEL:EFFICIENT MACHINE LEARNING TECHNIQUE FOR WEATHER FORECASTING”**

**Submitted by**

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**Under the Guidance of**

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**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**K R PETE KRISHNA GOVERNMENT ENGINEERING COLLEGE**

**K.R PET-571426**

**2023-24**

# **K R PET KRISHNA GOVERNMENT ENGINEERING COLLEGE**

**K. R PETE -571426**

(Affiliated to Visveswaraya Technological University, Belagavi, Approved by AICTE, New Delhi)

## **DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**



### **CERTIFICATE**

This is to certify that Mini Project report entitled **“SARIMA MODEL:EFFICIENT MACHINE LEARNING TECHNIQUE FOR WEATHER FORECASTING”** has been carried out by **BASAVARAJAPPA PRABHAPPA BELUR[4GK22CS400],VARSHINI T S[4GK22CS408], YASHASHWINI B M [4GK21CS055], SHREEDEVI T[4GK21CS060]** ,for the partial fulfilment of **Bachelor of Engineering in Computer Science and Engineering of Visveswaraya Technological University, Belagavi** during the year 2023-24. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report. The Mini Project work report has been approved as it satisfies the academic requirements in report of miniProject prescribed for the semester.

**Signature of the Guide**

**Dr. DEVIKA G**  
Assistant professor  
Dept. of CSE

**Signature of the HOD**

**Dr. Hareesh K**  
Associate Professor & HOD  
Dept. of CSE

## ACKNOWLEDGEMENT

We feel great pleasure in submitting this report “**SARIMA MODEL:EFFICIENT MACHINE LEARNING TECHNIQUE FOR WEATHER FORECASTING** ” .The successful completion of any task would be incomplete without the mention of people who made it possible and whose support had been a constant ofencouragement which crowned our efforts with success.

We express my sincere gratitude to **Dr. K R Dinesh**, the principal of K R pete Krishna Government Engineering College, K R Pet for providing healthy environment in the college, which helped in concentrating on the task.

We thank to entire faculty of the Computer Science and Engineering Department, especially **Dr. Hareesh K**, Head of the Department CSE, who has given me confidence to believe in ourselves and complete the project.

We give a great sense of satisfaction in acknowledging the encouragement & immense support of our Guide, **Dr. DEVIKA G** Assistant Professor of Computer Science and Engineering Department, for his valuable guidance, suggestion and consistent encouragement during the course of my mini project

We are thankful to all the staff members of the Department of Computer Science and Engineering for their support and encouragement.

Finally, we thank each and everybody who have directly or indirectly contributed to this work. We always welcome suggestions regarding the presented report.

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### **DECLARATION**

We, **BASAVARAJAPPA BELUR[4GK22CS400]**, **VARSHINI T S [4GK22CS408]**, **YASHASHWINI BM [4GK21CS055]**, **SHREEDEVI T[4GK21CS060]**, are respectively studying in the 6<sup>th</sup> semester of **Bachelor of Engineering in Computer Science at K R Pete Krishna Government Engineering College K R Pet, Mandya**. Hereby declare that the mini project entitled **“SARIMA MODEL:EFFICIENT MACHINE LEARNING TECHNIQUE FOR WEATHER FORECASTING”** has been carried out under the guidance of Dr. DEVIKA G Assistant Professor Department of CSE for the partial fulfillment of Bachelor of Engineering in Computer Science and Engineering of Visveswaraya Technological University, Belagavi during the year 2023-24. Belagavi during the academic year 2023-24.

Place : Krishnarajpet

Date:

**BASAVARAJAPPA PRABHAPPBELUR[4GK22CS400]**

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## ABSTRACT

Weather forecasting is a critical tool for many different applications, from agriculture and transportation to disaster preparedness and response. While weather forecasts are not always perfect, they provide valuable information that can help people make informed decisions and take appropriate actions to protect themselves and their property from the impacts of extreme weather events. In this paper, to forecast the weather we are using the SARIMA model as RMSE is 1.24 and analyse how it forecast the weather with high accuracy. Note that the SARIMA model is a machine learning (ML) technique used to forecast time series data that has both trend and seasonal components. It is an extension of the ARIMA model, which stands for Autoregressive Integrated Moving Average. To account for periodic changes in the data, the SARIMA model augments the ARIMA model with a seasonal component.

The SARIMA model is trained on historical weather data and can be used to predict future weather patterns. It is a powerful tool for weather forecasting as it can accurately predict both short-term and long-term weather trends. The quality of the input data determines how accurate the SARIMA model will be, and the model can be adjusted to perform better. In conclusion, the model known as SARIMA is a ML based approach that has been successfully used to predict weather.

It is a powerful tool that can handle non-stationary data and seasonal components and can accurately predict short-term and long-term weather trends. Accurate weather forecasting is critical for a wide range of applications, from agriculture to disaster management. This study explores the efficacy of the Seasonal Autoregressive Integrated Moving Average (SARIMA) model in predicting weather variables, such as temperature and precipitation, over varying time scales. SARIMA, an extension of the ARIMA model, incorporates both non-seasonal and seasonal components, making it well-suited for time series data with strong seasonal patterns.