PREDICTIVE ANALYSIS ON MEDICINES AVAILABILITY IN HOSPITALS USING MACHINE LEARNING AND DEEP LEARNING TECHNIQUE

A PROJECT REPORT

Submitted by,

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Under the guidance of,
Dr. SHANTHI S

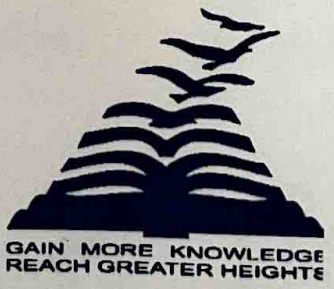
in partial fulfillment for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING(CYBER SECURITY)

AT



PRESIDENCY UNIVERSITY

BENGALURU

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PRESIDENCY UNIVERSITY

SCHOOL OF COMPUTER SCIENCE ENGINEERING

CERTIFICATE

This is to certify that the Project report **"PREDICTIVE ANALYSIS ON MEDICINES AVAILABILITY IN HOSPITALS USING MACHINE LEARNING AND DEEP LEARNING TECHNIQUE"** being submitted by "Chinmaya G P, Darshan U, Harsh Abhinav A, Deepak R, S Varun Kumar," bearing roll number(s) "2021CCS0046, 2021CCS0094, 2021CCS0035, 2021CCS0008, 2021CCS0006," in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering is a bonafide work carried out under my supervision.

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DECLARATION

We hereby declare that the work, which is being presented in the project report entitled **PREDICTIVE ANALYSIS ON MEDICINES AVAILABILITY IN HOSPITALS USING MACHINE LEARNING AND DEEP LEARNING TECHNIQUE** in partial fulfillment for the award of Degree of **Bachelor of Technology** in **Computer Science and Engineering**, is a record of our own investigations carried under the guidance of **Dr.SHANTHI S, ASSOCIATE PROFESSOR, School of Computer Science Engineering & Information Science, Presidency University, Bengaluru.**

We have not submitted the matter presented in this report anywhere for the award of any other Degree.

Chinmaya. G.P.

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ABSTRACT

Predictive analytics is an essential tool for optimizing hospital inventory management, especially for the availability of essential medicines. Accurate forecasting of medicine demand can reduce the risk of shortages and overstocking, leading to cost savings and improved patient care. This project explores the use of machine learning algorithms, specifically Random Forest, Decision Tree, and Convolutional Neural Networks (CNN), to predict the availability of medicines in hospitals. These algorithms analyze historical medicine usage data and incorporate external factors such as disease outbreaks, seasonal fluctuations, and hospital admission rates to predict future demand. The implementation of these models aims to optimize the hospital's medicine supply chain by providing accurate forecasts for inventory management. The results show that machine learning-based predictions significantly improve the accuracy of medicine availability forecasts, helping healthcare providers make informed decisions regarding stock levels.

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To further enhance the system's functionality, the project also integrates advanced data preprocessing techniques, such as feature scaling and dimensionality reduction, to ensure the algorithms handle high-dimensional data effectively. Moreover, a real-time dashboard was developed to visualize prediction trends, enabling healthcare administrators to monitor inventory status dynamically. Key performance metrics, such as Mean Absolute Error (MAE) and Root Mean Square Error (RMSE), were utilized to evaluate the models, with CNN demonstrating superior accuracy in scenarios involving complex, non-linear patterns.

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