Medicine Recommendation System Using Review Mining

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Abstract-

In this dynamic era of rapid technological advancement, the integration of digital technologies in the field of healthcare has widely proven to be a commendable innovation. The project aims to contribute effectively in healthcare sector by providing aid to people by the means of internet. It aims to provide reliable recommendation to patients with diseases on the basis of their medical records, health condition, reviews by patients on medications they received and ratings. The project works on Natural Language Processing, followed by training of the model, analysing its performance and improving it. The project works on two principle components: Review Mining and Rating Analysis. Review Mining is based on Sentiment Analysis of Reviews to comprehend the reviews of the patients. Rating Analysis will help us to determine the effectiveness of certain medicines which in turn will provide us a comparative efficacy of the medicine to cure respective diseases.

Keywords- *Machine Learning, Medicine Recommendation, Review Sentiment, Sentiment Analysis, Feature Extraction.*

I. Introduction

We live in a fast paced technological-driven generation in which technology has become a vital component of our everyday life. Rapid developments and innovations are made to integrate innovation with healthcare. Ease of internet, use of Artificial Intelligence, access to globally-available facilities proved to make our life easier drastically. Medicine Recommendation Project aims to provide an easy, rapidly available solution to address wide spectrum of diseases. The project recommends the most relevant medicines to the patients on the basis of their medical history and health condition. It works by performing an analysis on reviews and ratings collected from patients. Data pre-processing and cleaning is carried out to process the data efficiently and improve the accuracy.

Furthermore, text lemmatization is performed. The model is trained using the refined data. Various algorithms are tested for accuracy. Algorithm with the maximum accuracy is chosen to integrate with the model , to perform the desired task. The model recommends the medicine on the basis of information provided by the user.

II. Literature Review

In healthcare sector, various contributions have been made. Certain research works shows the contribution through their studies and proven effective in this field.

Project	Conference	Related Work
A review on data mining techniques in healthcare sector; by Kavyasree S Anil A, Richa Jain [1]	International Conference of Innovative Computing & Communication (ICICC), 2022.	Provided an analysis of certain medications derived from data between 2017 and 2019. The analysis were used to identify effective medications on the basis of medical conditions.
A machine learning based drug recommendation system for healthcare; by Mahima Mohapatra et al.[2]	Graduate Research in Engineering and Technology(GRET), 2022	Helped patients to make accurate medication choice by analyzing drug review and ratings.
Medicine Recommendation System using ML; by Prof. Harna Bodele el al.[3]	International Journal For Research In Applied Science & Engineering Technology(IJRASET), 2024	Delivered personalized and accurate medication recommendations by analyzing patient's data and correlating it with known data of diseases and medications.
Recommendation of Drug Based On Its Reviews Using Machine Learning; by Roopa D E et al.[4]	International Journal of Research in Engineering and Science (IJRES), 2022	Analyses the worth of drugs, whether it is suitable to be used or not. It determines if the effects of the drugs are positive or negative.

Medicine Recommendation System; by Varun A.Goyal et al.[5]	International Research Journal of Engineering and Technology (IRJET), 2020	Data mining techniques were created and used to build recommendation systems. These systems take advantage of hidden information in medical records to help reduce medical mistakes. In simple terms, the goal is to use the valuable data from patient records to make better decisions and lower the chances of errors in healthcare.
Medicine Recommendation System Based On Patient Reviews; by T. Venkat Narayana et al.[6]	International journal of Scientific & Technology Research,2020	Proivdes recommendation to patients about the medicines based on patient's reviews.

III.   Research Methodology

The dataset is gathered from year 2017 to 2019. A detailed analysis is conducted using Matplotlib, Seaborn, NumPy and Pandas. The initial results will highlight the top 20 and bottom 20 drugs for a particular medical condition. Further analysis is conducted which focuses on ratings between 1 and 10, along with an in-depth review analysis. The rating analysis classifies the medicines from 1 to 5 as negative and 6 to 10 as positive. It also calculates the mean rating for each month and year. Review analysis examines data from 2017 to 2019, identifying the months and years with the highest number of reviews. Next step includes data pre-processing and data-cleaning which involve detecting any null values present in the dataset. A word cloud for reviews is generated. Stop words such as "is," "are," and "am" etc. are removed, since they do not hold any significant value. This helps in improving text-processing efficiency and increase accuracy. The word cloud analysis reveals the top 20 and bottom 20 most frequently used words. Text data is thoroughly cleaned by removing stop words, extra spaces, and performing lemmatization to prepare it for further analysis. Any condition which involves only 1 drug, is eliminated to ensure relevant comparisons.

A machine learning pipeline is developed where models and algorithms are trained with training dataset. The algorithm which results in achieving maximum accuracy is selected. This system is integrated with a user interface featuring a dropdown list, allowing users to select a medical condition and receive medicine recommendations. As a future scope, the project aims to integrate with an e-commerce platform, enabling users to purchase recommended medications seamlessly.
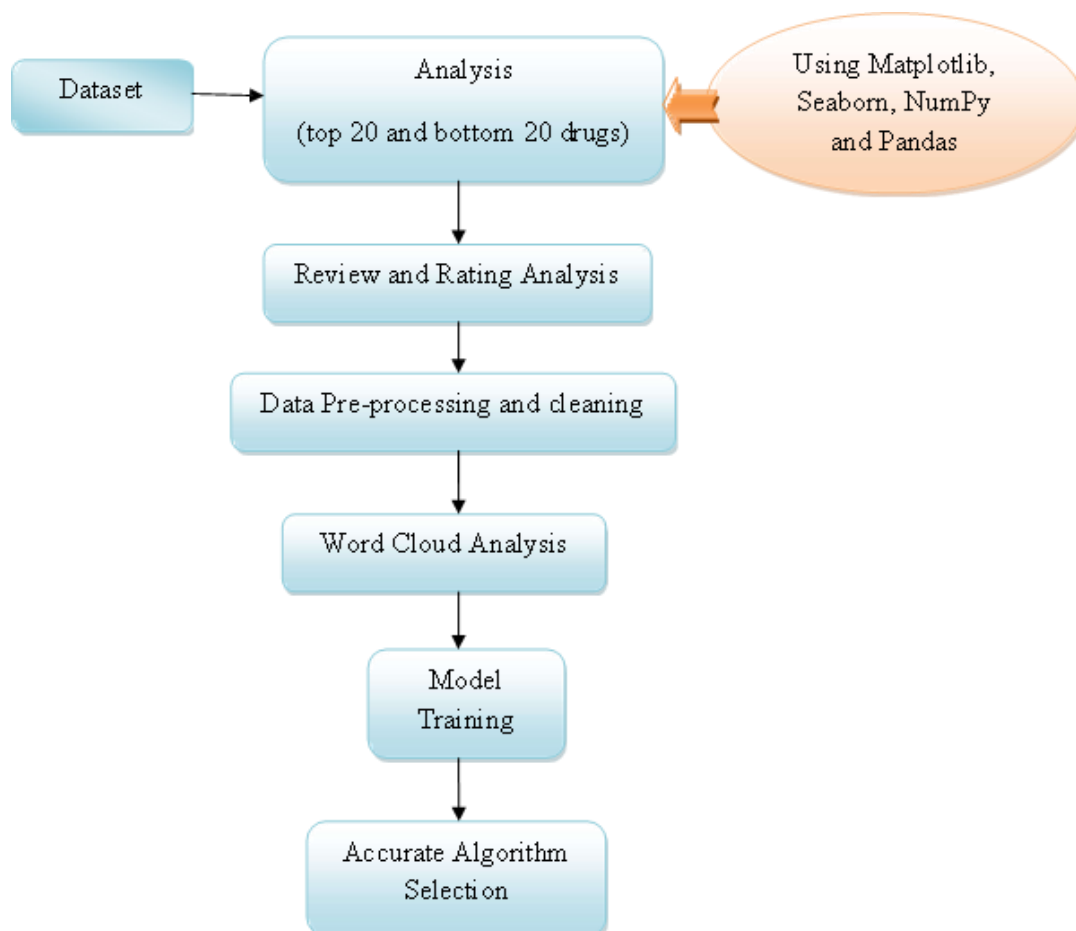
IV.   Conclusion

This project highlights the importance of Machine Learning in the field of Healthcare. It focuses on contributing in the field of medicine and healthcare and promoting ease of use through a user-interactive interface and the model is trained to assist the patients. It delivers the most efficient output to the desired input, improving the overall performance of the system. Existing research works show the most effective algorithms so far were developed using Sentiment Analysis, SVM Algorithm, Filter-based algorithms.

The incorporation of user's medical history, reviews and ratings provides the system, capability to work on user's data, efficiently. Hence it provides more accurate results. Moreover, it trains the model to process information through a large set of data which helps in training the model precisely.

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