Medicine Recommendation System

Under the guidance of Mr. Prasanna Roy

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INTRODUCTION

Welcome to the future of personalized medicine where AI plays a key role in recommending the best treatment options for individual patients. It not only provides medicines based on the symptoms along with that it provides diets workouts more over a proper lifestyle to treat that disease.

Challenge:
Tailoring Medicine, Diets, workouts based on symptoms

1. Personalized Medicine

Personalized Medicine based on the symptoms after analyzing the disease

2. Personalized Diets

This model will suggest proper diets based on the medications

3. Personalized workouts

It will suggest personalized workouts based on the symptoms .

4. Data Overload

We need help from doctors to make sure that all the data are working properly.

Data Foundation: Building the System

1. Data Collection

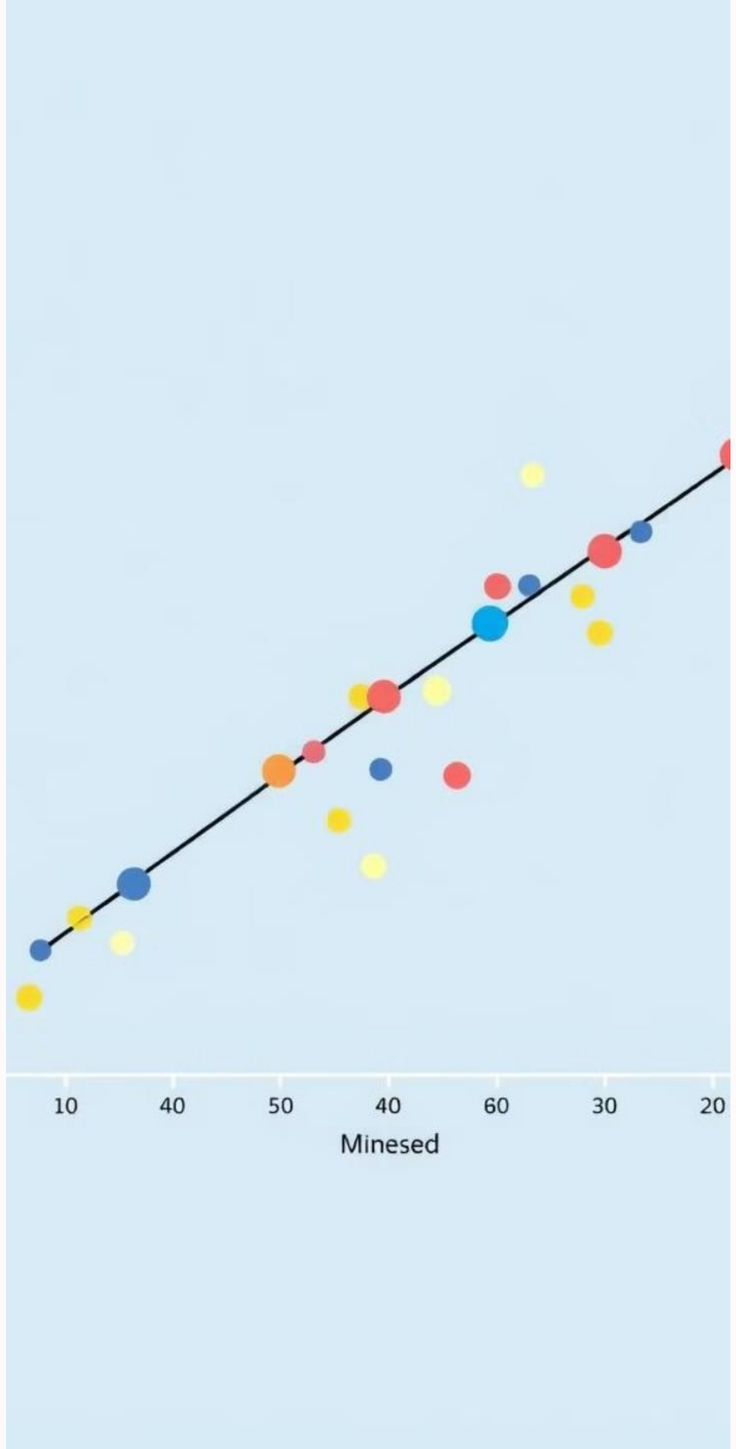
Gathering diverse medical data from Kaggle . We have collected total five datasets, training dataset for the disease purpose , diet and workouts all are in .csv format

2. Data Cleaning

Identifying and removing inconsistent or missing data to ensure model accuracy. After cleaning we pre-processed the data for further work.

3. Feature Engineering

Transforming raw data into meaningful features like we the encoded the predicted values to operate linear regression on it.



Linear Regression: A Starting Point

Step 1

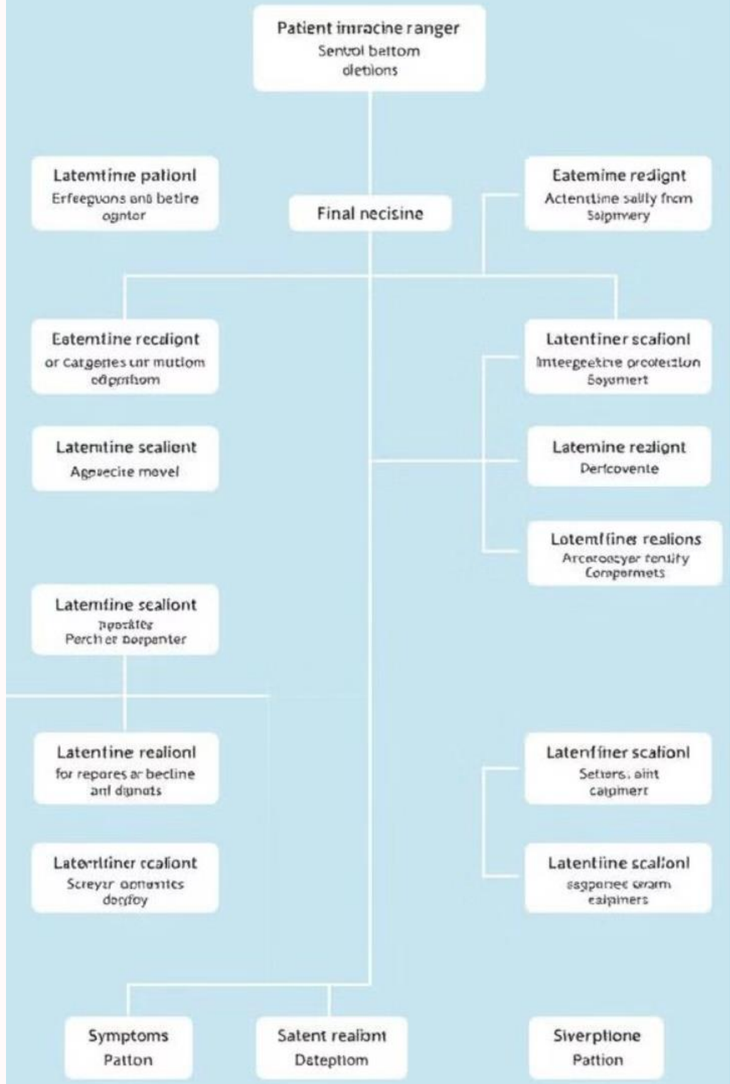
Identifies linear relationships b/w medical features then encode the prognosis data and then operate the linear regression.

Step 2

We need to make sure that the residual sum of square of each dimension should be nearest to zero. If there is any zero value we need to fix it.

Baseline for Comparison

LR always provides a foundation to compare more complex models.



Random Forest: Enhanced Accuracy by classifying

Ensemble Learning

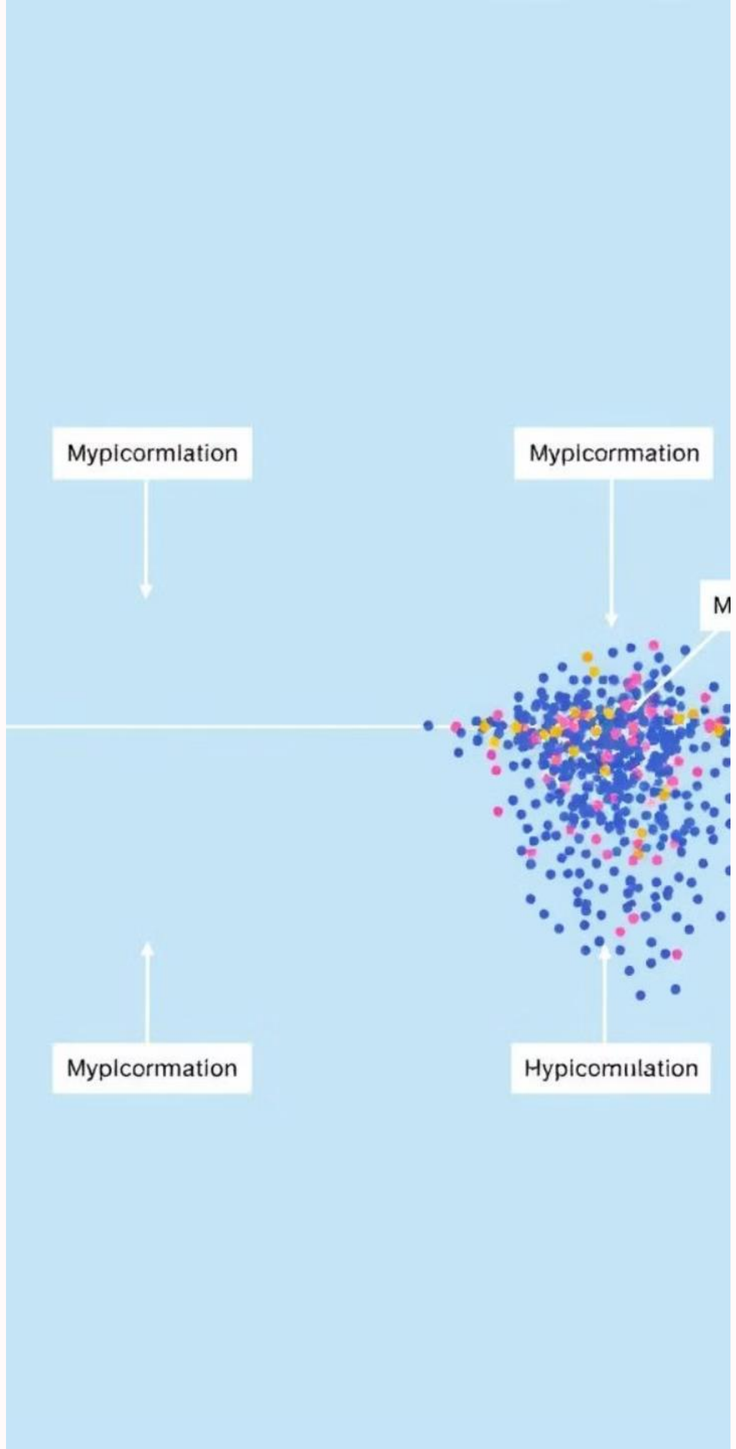
Combines multiple decision trees to make predictions.

Improved Accuracy

Often outperforms linear models, providing more accurate predictions. As we don’t predict anything incase of decision trees or random forest . We simply work on the data by bifurcation based on the value of Gini index or entropy

Robust to Noise

Less susceptible to overfitting and noisy data.



Support Vector Machine: Seeking Separations

1

Finding Boundaries

Identifies a hyperplane that best separates data points into different medication classes.

2

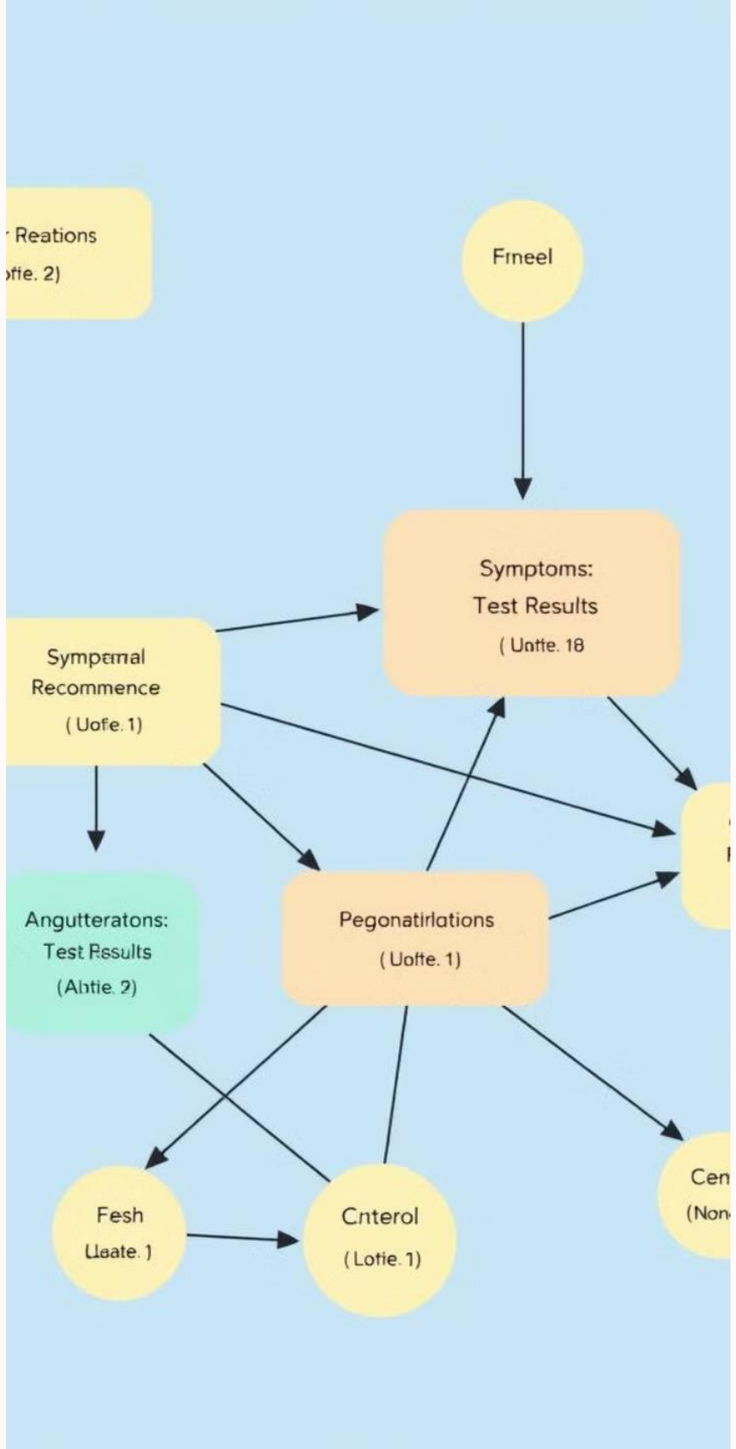
High Dimensional Data

Model Training and Testing Process with Support Vector Classifier.

3

Generalisation

Can generalise well to unseen data, ensuring reliable recommendations.



Naive Baye’s: Probabilistic Insights

1

Probabilistic Approach

Calculates probabilities of different medication recommendations based on patient features.

2

Fast and Efficient

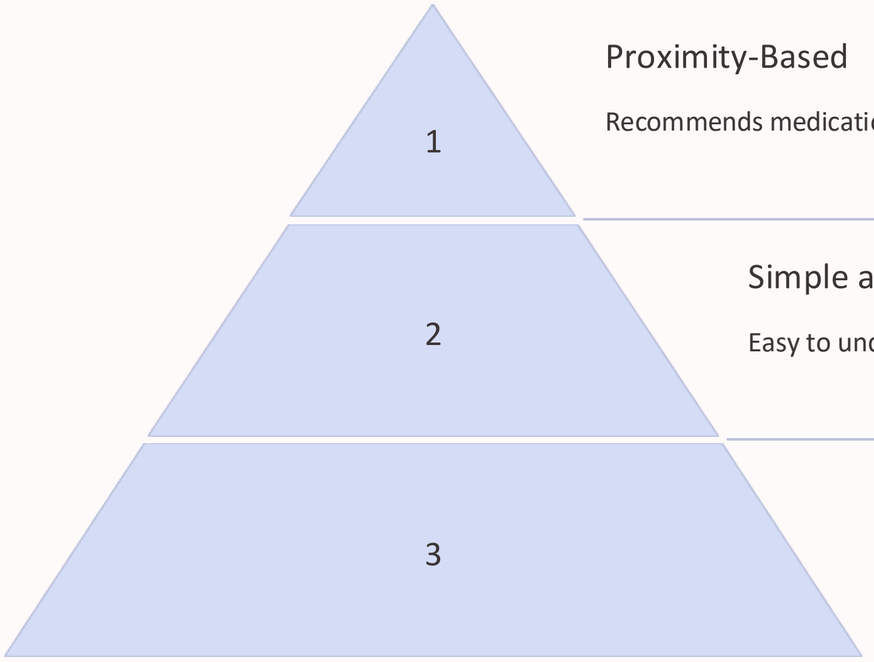
Can make predictions quickly, making it suitable for real-time recommendation systems. It can work well even there is a zero probability of something . Using the alpha based on the values of the classes of each dimension we can do very effective predictions

3

Simple and Effective

Often performs well despite its simplicity, providing valuable insights into medication probabilities.

K-Nearest Neighbours: Finding Similar Cases



Proximity-Based

Recommends medication based on the majority class of its nearest neighbors.

Simple and Intuitive

Easy to understand and implement, making it a good choice for initial testing.

Sensitivity to Data

Performance can be influenced by the quality and distribution of the data.

Requirements to make web-page

1

HTML

Creating the outline using the html , identifying the URL and template errors ,

2

Css

Adding the colours and other requirements using CSS

3

JS

Using JS for interactive buttons

Applications

1M+

Patients

Potentially reaching millions of patients with personalized medication recommendations.

10%

Improved Outcomes

Improving treatment outcomes by 10% or more through better medication choices.

1B+

Cost Savings

Saving billions of dollars in healthcare costs by reducing unnecessary treatments.

Advantages

1. Improved Accuracy and Precision.
2. Speed and Efficiency.
3. Data-Driven Insights
4. Cost-Effectiveness.
5. Remote Accessibility.
6. Continuous Learning

Disadvantages

1. Data Dependency
2. Lack of Interpretability
3. Ethical Concerns
4. Regulatory and Legal Challenges
5. Over-reliance on Technology
6. Implementation Costs

CONCLUSION

The conclusion of a study or project on a medicine prediction system using machine learning typically highlights the significance, effectiveness, and potential applications of the system. Here's a structured example of what such a conclusion might entail:

1. **Effectiveness**:

The machine learning-based medicine prediction system demonstrated significant potential in accurately predicting suitable medicines for specific diseases or patient profiles. The system showed high accuracy, precision, and reliability in its predictions during testing and validation phases.

2. Scalability and Adaptability:

The system is scalable to include a wider range of diseases and medications as more data is incorporated. Additionally, it can adapt to advancements in medical knowledge and evolving drug databases.

3. **Impact on Healthcare**:

It has the potential to revolutionise personalized medicine by offering tailored recommendations based on patient-specific data, such as genetic information, medical history, and current symptoms. This could lead to improved patient outcomes and reduced instances of adverse drug reactions.

4. **Limitations and Future Work**:

Despite its promise, the system's effectiveness may be limited by the quality and quantity of training data. Ethical concerns, such as data privacy, bias in training datasets, and the need for regulatory compliance, must be addressed. Future work could focus on integrating real-time data, improving interpretability, and validating the system in diverse clinical environments

Thank You