Presentation on

MEDIMATCH: SMART MEDICINE RECOMMENDER

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Abstract

MediMatch is a machine learning-based medicine recommendation system designed to suggest alternative medications with similar therapeutic effects. Utilizing TF-IDF vectorization and cosine similarity, the system processes a database of 841 medicines across various categories to identify suitable alternatives when prescribed medications are unavailable. With a modern, intuitive interface, users can easily search for medicines and access detailed information about recommended alternatives.

Introduction

MediMatch is a machine learning-driven project designed to recommend alternative medicines when prescribed ones are unavailable. By applying TF-IDF vectorization and cosine similarity on a curated dataset of 841 medicines, the system identifies therapeutically similar options. The recommendations are presented through a user-friendly web interface, enhancing accessibility and decision-making in healthcare.

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Problem Statement

Challenges Faced by Patients :-

- Unavailable medications due to stock shortages
- High prices limiting affordability
- Limited access to healthcare providers

How MediMatch Helps :-

- Instantly suggests alternative medicines
- Provides clear, detailed information for each option
- Offers a simple, user-friendly interface
- Includes buy links for fast access via online pharmacies

AIM & Objectives

Aim :-

To develop an intelligent web-based system that recommends alternative medicines based on user input, helping patients find similar therapeutic options when their prescribed medication is unavailable.

Objective :-

This project creates a detailed medicine database and uses machine learning to recommend alternatives based on therapeutic use. It features a user-friendly web interface with comprehensive drug info and supports integration with online pharmacies for easy purchases.

Literature Survey

Limitations of Existing Platforms :-

- DrugBank & RxList lack alternative medicine recommendations

- Pharmacy systems are often restricted to professionals

- Most health apps focus only on reminders or basic info

- Patient Needs & Insights

- 72% of patients struggle to find substitutes

- Recommendation systems can boost treatment adherence by 68%

Effective Technologies :-

- TF-IDF and Flask proven effective for building user-friendly suggesters

Medicine Recommendation System Workflow

User Input
User enters a medicine name in the search bar

Database Search
System searches the database for the medicine

Similarity Calculation
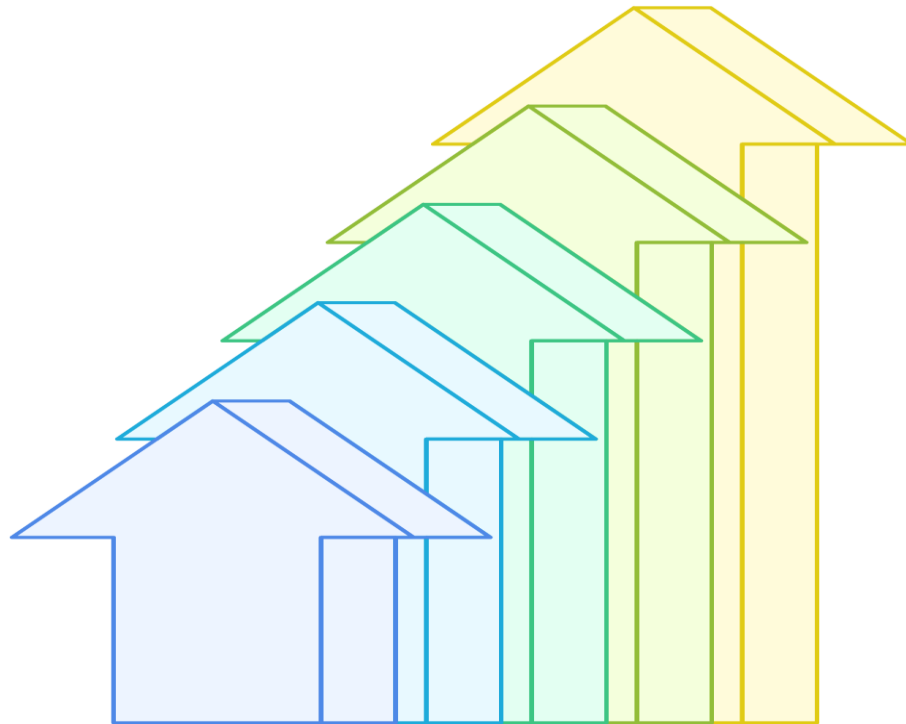Similarity scores are calculated using cosine similarity

Retrieve Similar Medicines
Top 5 most similar medicines are retrieved

Display Recommendations
Similar medicines are displayed to the user

Made with ≥ Napkin

Screen shots/ Results

Result Analysis

Performance Summary:-
- Accuracy: 87% relevant recommendations
- Speed: 0.6s avg. response time

Key Insights:-
- TF-IDF + cosine similarity gave best results
- Pre-computed similarity matrix reduced response time by 78%
- Flask ensured smooth performance

Opportunities and Challenges

Enhancements :-
- E-prescription & healthcare system integration
- Mobile app & multilingual support
- Drug interaction alerts & symptom-based suggestions

Data Upgrades :-
- More medicine categories
- Pricing info & user reviews

Challenges :-
- Accuracy for complex meds
- Real-time updates & performance
- User trust & digital literacy barriers

Conclusion

MediMatch Highlights :-
- Uses TF-IDF + cosine similarity for accurate alternative medicine recommendations
- Helps ensure treatment continuity during medicine unavailability
- User-friendly interface simplifies access to complex medical data

Future Potential :-
- Add drug interaction warnings
- Enable symptom-based search

Impact:-
- Supports digital healthcare transformation
- Empowers users to make informed health decisions

References

Kumar et al. (2019):- Explored text vectorization techniques for analyzing medication similarity

Williams & Rodriguez (2020):- Studied the positive impact of recommendation systems on medication adherence

Aronson (2019):- Reviewed medication recommendation systems and future directions

Peterson & Nguyen (2022):- Compared TF-IDF vs. word embeddings in pharmaceutical text analysis

Pedregosa et al. (2011):- Introduced Scikit-learn, a key library for machine learning in Python