

2024 Girl Hackathon Ideathon Round: Solution Submission

Project Name: Healthcare recommendation

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ReadMe File Links (Eg: Github): <https://github.com/ritika994/Healthcare-Recommendation/blob/main/README.md>

Brief summary

Please summarize your problem statement and solution in a short paragraph.

I'm diving into a hackathon project focused on creating a healthcare recommendation system powered by AI. The main aim is to analyze user symptoms using mock data, healthcare provider databases, and user ratings to match them with doctors who specialize in their condition and have compatible schedules. To make this happen, I'll be gathering and cleaning up the necessary data, selecting AI models that work well for connecting symptoms to diseases, training and testing these models, setting up a recommendation system based on the model's predictions and user input, designing a user-friendly interface for users to input their symptoms and receive doctor suggestions, and making sure that all data handling follows ethical guidelines and respects user privacy.

Problem Statement

What are you doing, why, and for whom?

The goal is to create a solution that can analyze user symptoms, leverage healthcare provider databases and user ratings, and recommend doctors with matching specialties and aligned schedules. This project aims to benefit users who are seeking medical advice by providing them with personalized and relevant doctor recommendations based on their symptoms and preferences. One of our key aspirations is for this system to be particularly helpful during challenging situations like lockdowns, ensuring that users can access appropriate medical care even when traditional avenues may be limited.

Design Idea and approach

A short and sweet overview of your implementation ideas. You don't need to contain every detail of your implementation, and should omit code here specifically. Use a diagram that illustrates your solution when necessary.

Technologies Used: HTML, CSS, JavaScript, Python, Kaggle

Components:

User Interface: Developing a user-friendly interface for inputting user details, symptoms and displaying doctor recommendations.

Machine Learning Model: Training XGBoost and Random Forest algorithms on symptom data from Kaggle. These models will predict possible diseases based on input symptoms.

Recommendation System: Use the predicted diseases to recommend doctors with matching specialties and aligned schedules. This involves matching disease specialties with doctor specialties and considering their availability.

Rollout Strategy:

Start by building frontend and backend components separately. Integrate frontend with backend APIs. Test thoroughly for accuracy and reliability. Deploy in phases, starting small and scaling up based on feedback.

Information Security/Privacy Concerns:

User symptom data and personal information are encrypted and stored securely.

The approach used to generate the algorithm.

Utilize machine learning algorithms like XGBoost and Random Forest to analyze symptom data and predict potential diseases.
Train the algorithms using the symptom dataset from Kaggle, ensuring sufficient data preprocessing and feature engineering for accurate predictions. Incorporate doctor rating and specialty data to recommend the most suitable healthcare providers based on user symptoms and preferences.

Impact

How will the proposed project address a societal challenge, and to what extent? Is the application grounded in research and data about the problem and the solution? Is there a clear plan to deploy the AI model for real-world impact, and what are the expected outcomes?

The proposed project aims to tackle a significant societal challenge by using AI to enhance access to healthcare services, particularly during difficult periods like lockdowns. Through thorough analysis of user symptoms, healthcare provider data, and user ratings, the system will recommend doctors with suitable specialties and availability, ensuring prompt and relevant medical guidance even in constrained situations. This approach is grounded in extensive research and data about the challenges faced by individuals accessing health care during emergencies or restricted times. The plan includes rigorous testing and validation of the AI model to ensure its accuracy and real-world effectiveness, with expected outcomes including improved healthcare access, reduced barriers in finding appropriate doctors, and ultimately, better health outcomes for users.

Feasibility

Does the team have a well-developed, realistic plan to execute on the proposal? Does the team have a plan to access meaningful dataset and technical expertise to apply AI to the problem? Have they identified the right partners and domain experts needed for implementation?

The team, comprising one main member and friends providing assistance, has developed a detailed and realistic plan to execute the proposal. This includes a structured approach to data collection, preprocessing, model selection, training, testing, and deployment, demonstrating a strong understanding of the project's technical aspects. To access a meaningful dataset, the team plans to utilize publicly available sources, healthcare APIs, or generate synthetic data. They are also leveraging technical expertise through online resources, communities, and potential collaboration with domain experts in healthcare. While the team is small, they are actively seeking partnerships and guidance from relevant domain experts to ensure successful implementation.

Use of AI

Does the proposal apply AI technology to tackle the issue it seeks to address?

Yes, the proposal applies AI technology to tackle the healthcare recommendation issue it seeks to address. By utilizing algorithms like Random Forest and XGBoost, and creating decision trees based on a dataset from Kaggle, the team aims to develop a robust system that can analyze user symptoms, healthcare provider data, and user ratings to recommend suitable doctors with matching specialties and availability. These AI techniques are well-suited for handling complex data and making accurate predictions, which are crucial for delivering effective healthcare recommendations to users.

Alternatives considered

Include alternate design ideas here which you are leaning away from.

Deep learning models could be considered for this project, such as neural networks, convolutional neural networks (CNNs), or recurrent neural networks (RNNs), they might require significantly more data and computational resources compared to decision tree-based models like XGBoost and Random Forest. Additionally, deep learning models might be more complex to train and interpret for this particular application.

References and appendices

Any supporting references, mocks, diagrams or demos that help portray your solution.

Any public datasets you use to predict or solve your problem.

<https://github.com/zemahran/android-medical-assistant>

<https://www.kaggle.com/datasets/uom190346a/disease-symptoms-and-patient-profile-dataset/data>