Girl Hackathon 2024

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AI for Social Good

Theme:

The evolution of AI has been nothing short of extraordinary. From humble beginnings, machines now learn, adapt, and even create with startling sophistication. Let's focus on using this power to address the challenges we face.

The greatest innovations are those that solve real-world problems and make a positive difference. This hackathon is a chance to create solutions that improve lives, streamline processes that make a tangible difference in healthcare, education and sustainability, and countless other fields for the next billion users. Let's make this hackathon a testament to a future where AI isn't just intelligent – it's transformative.

Participants are encouraged to create an application or enhance existing platforms to achieve the following goals: **[Choose 1 of the following]**

Problem Statements:

- **Adaptive Learning for Basic Education:** Develop a virtual tutor platform that assesses the learner's understanding level at every step and curates relevant content to enhance the learning experience.
- **Disaster Relief:** Enhance disaster relief and response efforts by leveraging satellite imagery during disasters like floods and wildfires, integrating existing geospatial information, and utilizing environmental data for affected regions.
- **Medical Assistant:** Develop a healthcare recommendation system that analyzes user symptoms leveraging symptom data (using mock data), healthcare provider databases, and user ratings, recommends doctors with matching specialties and aligned schedules

Goodluck!

Submission:

Participants are required to create a PDF document as the final submission. The document should contain the link to a public GitHub repository (accessible and open to all).

The repository should have all the collaterals of the code, along with a README file. The code can be written in any open-source programming language using standard open-source libraries.

The README file should cover how to generate the environment needed to run the code, how to run the code, and any other necessary information.

Evaluation Rubrics:

- Potential Impact of Proposed idea (25%)
- Usage of correct DS/Algorithm and AI technique (40%)
- Code Quality (20%)
- Testing (15%)

Find Template to use below

(3 Pages Maximum from the template below)

2024 Girl Hackathon Ideathon Round: Solution Submission

Project Name: Medical Assistant

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ReadMe File Links (Eg: Github):https://github.com/anushkaagrawal27/Girl_hackathon_Stage_3/blob/main/README.md

Brief summary

The project aims to develop a comprehensive healthcare recommendation system that analyzes user symptoms, recommends doctors with matching specialties and aligned schedules, and suggests appropriate medications. Leveraging machine learning techniques, the system provides personalized recommendations tailored to individual needs, improving access to healthcare services and enhancing patient outcomes. By integrating symptom data, healthcare provider databases, and user ratings, the system empowers users to make informed decisions about their healthcare needs while optimizing resource utilization and streamlining the treatment process. With its scalability and adaptability, the system has the potential to revolutionize healthcare delivery and contribute to advancements in medical research.

Problem Statement

The project aims to develop a healthcare recommendation system that utilizes AI technology to analyze user symptoms, medical history, and other relevant factors to predict diseases, recommend appropriate medicines, and suggest specialist doctors. This system addresses the challenge of efficiently matching patients with suitable medical professionals and treatments, ultimately improving healthcare accessibility and patient outcomes. It caters to individuals seeking medical advice and assistance in making informed healthcare decisions.

Design Idea and approach

Technologies Used:
The implementation involves Python for data preprocessing, machine learning model training, and web application development. Libraries such as pandas, scikit-learn, and Streamlit will be used for data manipulation, model building, and creating interactive web interfaces, respectively.

New components include:

Web Application: A user-friendly interface developed using Streamlit to enable users to input symptoms and receive personalized disease, medicine, and doctor recommendations.
Machine Learning Models: Decision Tree and Random Forest classifiers trained to predict diseases, recommend medicines, and suggest specialist doctors based on user input.
Scaling Parameters:
Dominant scaling parameters include the size of the dataset, concurrent user requests, and model prediction time. These parameters determine the system's ability to handle large datasets, accommodate simultaneous user interactions, and respond promptly to user queries.

In future to address information security and privacy concerns:

Data Encryption: Ensure data encryption during transmission and storage to protect sensitive user information.
Access Controls: Implement access controls and user authentication mechanisms to restrict access to authorized personnel only.
Data Protection Policies: Establish clear data protection policies and guidelines to safeguard user privacy and confidentiality.

Algorithmic Approach:

Data Collection: Acquire a diverse dataset containing symptoms, diseases, medicines, and doctor information.
Data Preprocessing: Clean the dataset, handle missing values, and encode categorical variables into numerical format suitable for machine learning models.
Model Training: Utilize supervised learning techniques to train classifiers for disease prediction, medicine recommendation, and doctor specialization matching.
Web Integration: Develop a web interface to facilitate seamless interaction with the recommendation system, allowing users to input their details and receive personalized recommendations in real-time.
Evaluation and Iteration: Continuously evaluate model performance and incorporate user feedback to refine and enhance the recommendation system over time.

Impact

The project is grounded in research and data about the problem, as it utilizes a dataset containing symptoms, diseases, medicines, and doctor information for model training.
A clear plan to deploy the AI model for real-world impact involves the development of a user-friendly web application where individuals can input their symptoms and receive personalized recommendations instantly. The expected outcomes include:

- Improved Healthcare Access: Providing individuals with access to personalized disease predictions, medicine recommendations, and specialist doctor suggestions, thereby enhancing healthcare accessibility.
- Enhanced Treatment Effectiveness: Offering tailored healthcare solutions based on individual symptoms and medical history, leading to more effective treatment outcomes.
- Time and Cost Savings: Streamlining the healthcare decision-making process by providing instant recommendations, reducing the need for multiple consultations and trial-and-error approaches.
- Empowering Patients: Empowering individuals to take proactive control of their health by providing them with actionable insights and recommendations.

Feasibility

yes,I tried to make a well developed plan .The dataset requirements where not available in any website so i downloade a csv file from kaggle for medicine recommendation and some more csv file for doctor recommendation and for ratin .project demonstrates technical expertise in AI through the use of machine learning algorithms for model training and prediction. You have applied AI techniques such as data preprocessing, model building, and prediction generation, indicating proficiency in leveraging AI technology to address the problem at hand.

Use of AI

Yes, the given code makes use of AI technology to solve the medical recommendation and doctor prediction problem It uses machine learning algorithms, including Random Forests and Decision Trees, to evaluate patient data and foreca the condition, suggested medication, and suitable physician specialist based on symptoms, underlying reasons, and other pertinent variables. Furthermore, the integration with Streamlit makes it possible to develop an intuitive web application that lets users enter their details and get tailored medical advice. In general, the initiative uses AI to improv patient outcomes and healthcare decision-making.

Alternatives considered

Another option that was considered involved manual feature engineering, where additional features would be manually created from the raw data. However, this approach was deemed time-consuming and potentially less effective compared to automated feature selection techniques employed by machine learning algorithms. Therefore, the focus shifted towards leveraging the inherent capabilities of machine learning algorithms to extract relevant features from the data automatically.

References and appendices

The project topic which i choose (**Medical Assistant)** i didn't find any relevent dataset present for this project.I read some articles for the similar problems such as
https://medium.com/@marshettyruthvik/drug-recommendation-system-1b32d1cda680
and some paper such as
https://paperswithcode.com/paper/dialmed-a-dataset-for-dialogue-based

for a recommendation of drugs .
I downloaded a durg recommendation sytem dataset from kaggle .and made some changes in it. in the previous dataset i just had Date of birth , cause, gender and medicine.I added some more column with the help of different articles and dataset by numerous website.The columns i added were doctor name,specialist and their rating according to the people .