Project Title : HealthConnect: Integrated Medical Records and Wellness Management App

Project Summary

HealthConnect is an innovative application that combines a medical record management system with essential health and fitness features. The app enables healthcare providers to input and access patient medical histories, symptoms, and diagnoses while empowering patients to monitor their health through personalized fitness and wellness tools. By integrating medical record management with health tracking capabilities, HealthConnect enhances communication between doctors and patients, fostering a holistic approach to health management.

Project Description

HealthConnect aims to tackle the challenges of managing health data by providing a unified platform for both healthcare providers and patients. The primary problem it seeks to address is the disconnection between medical records and personal health management, which can hinder effective treatment and patient engagement.

The application will allow doctors to enter and manage patient information, including medical histories and symptom data, to support accurate diagnoses. On the patient side, HealthConnect will offer features such as personalized workout plans, nutrition tracking, and health goal setting. This integration encourages patients to actively participate in their health journeys while ensuring that healthcare providers have comprehensive insights into their patients' overall wellness.

Creative Component(technically challenging features): The creative component of *HealthConnect* lies in its integrated health features within the medical record system. The app will analyze fitness and nutrition data alongside medical records to generate tailored health recommendations and alerts. This analysis will involve several key steps:

1. **Data Integration**: The app will combine data from fitness trackers, such as physical activity levels, heart rate, and sleep patterns, with nutrition information like calorie intake and macronutrient distribution. This integration will require robust data preprocessing to ensure consistency and accuracy across different data types.
2. **Behavioral Pattern Identification**: By examining historical data, the app will identify patterns in patients' behaviors and health metrics. For example, it might recognize that decreased physical activity correlates with increased stress levels

or changes in medication adherence. The app will employ algorithms to detect these trends over time, providing valuable insights into user health.

3. **Insights for Healthcare Providers**: The analysis of combined data will yield insights that can influence treatment decisions. For instance, if a patient's fitness data indicates a lack of physical activity, coupled with medical records showing high cholesterol levels, the app can alert healthcare providers to recommend tailored interventions, such as an exercise program or dietary changes.
4. **Alert System**: The app will generate alerts based on identified behavior patterns and health metrics. If a user's activity drops significantly or their nutrition logs indicate poor dietary choices, the app can notify both the user and their healthcare provider. This proactive approach can help in early intervention and better management of chronic conditions.
5. **Google Calendar Integration**: To enhance user experience, the app will utilize the Google Calendar API to facilitate appointment scheduling. Users can sync their health-related appointments with their personal calendars, ensuring they stay informed and organized regarding their healthcare visits.

Usefulness: HealthConnect is designed to serve multiple roles—healthcare providers can efficiently manage and analyze patient data, while patients gain access to tools that promote healthier lifestyles. Basic functions will include medical record management, symptom tracking, and fitness/nutrition logging. While applications like MyChart and Fitbit exist, HealthConnect uniquely combines these functions into one cohesive platform, facilitating better communication and engagement.

Realness:

To ensure HealthConnect is built using real-world data, we will integrate multiple datasets that provide authentic medical and fitness information. This approach allows the application to reflect real health scenarios for both doctors and patients.

The National Health and Nutrition Examination Survey (NHANES) dataset, available from Kaggle, will serve as a core source of health data. This dataset captures vital health metrics such as body measurements, laboratory test results, and examination findings. With detailed insights into nutritional status and physical health, this data will power the medical record management feature, giving access to real patient data to analyze and track treatments.

NHANES Dataset Link:
https://www.kaggle.com/datasets/cdc/national-health-and-nutrition-examination-survey?select=examination.csv

On the fitness and wellness side, HealthConnect will integrate the Fitbit Fitness Tracker dataset from Kaggle, which tracks detailed fitness metrics such as daily activity levels, step counts, calories burned, heart rate, sleep patterns, and nutritional habits. This dataset provides real-time data on users' fitness journeys and allows for continuous monitoring of their wellness routines. This data will help drive the personalized fitness tracking features of HealthConnect.

FitBit Dataset Link: https://www.kaggle.com/datasets/arashnic/fitbit

By combining these sources, HealthConnect will deliver a holistic health management platform grounded in real-world clinical and fitness data.

Functionality:

For Patients:

- **Medical Record Management**: Patients can view their medical history, test results, and prescriptions, allowing for better understanding and engagement in their healthcare.
- **Symptom Tracking**: Users can log symptoms over time, providing valuable data for both personal insights and medical consultations.
- **Fitness and Nutrition Tracking**: Patients can set health goals, track workouts, log meals, and receive personalized workout plans and nutrition advice tailored to their needs.
- **Health Insights and Recommendations**: Based on the logged data, patients will receive tailored health insights and alerts for potential health issues, empowering proactive health management.

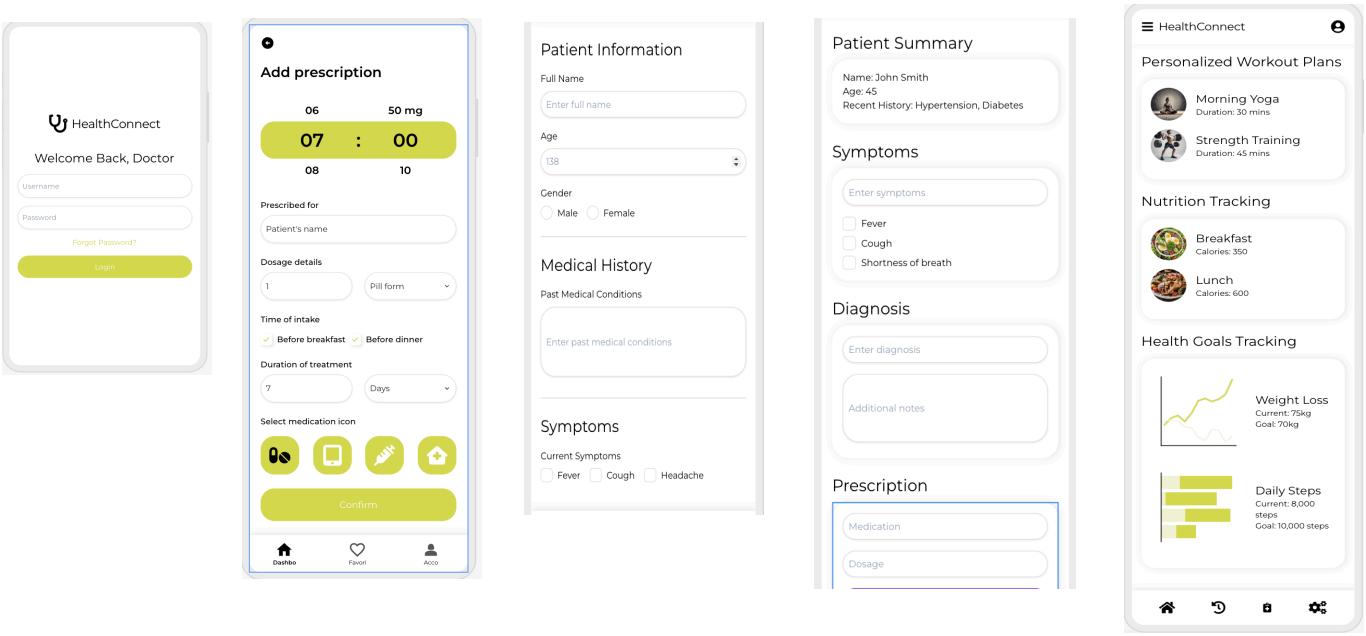
For Doctors:

- **Patient Data Management**: Doctors can easily input and access patient information, including symptoms, medical history, and treatment plans, streamlining the process of patient care.
- **Diagnosis Suggestions**: The app can provide preliminary diagnosis suggestions to support hypotheses based on entered symptoms and historical data, aiding doctors in their clinical decision-making.
- **Real-Time Updates**: Doctors can view real-time updates on patients’ health metrics from fitness tracking, allowing them to tailor treatment plans more effectively.

- **Communication Portal**: The app includes a secure messaging system for doctors and patients to communicate about appointments, health concerns, treatment options, and follow-ups.

The interface will facilitate seamless interactions for both parties, allowing users to create, edit, and delete records or fitness entries effortlessly.

A low-fidelity UI mockup:



Project Work Distribution: Team members will be assigned specific roles, including database management, front-end development, back-end integration, and UI/UX design.

Front-end and UI/UX: Since we plan to have multiple pages for healthcare professionals and for patients, we will divide the work evenly.

- Doctor dashboard and profile: Keisha
- Patient dashboard and profile: Akriti
- Fitness and Nutrition tracking: Shobhit
- Login and appointments page: Abbas

Back-end and Database Management: We will distribute work based on functionality.

- Medical records/patient information: Keisha
- User profiles: Akriti
- Fitness and Nutrition data: Shobhit
- GCal integration and appointments: Abbas