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Using Data for Fitness & Nutrition Recommendations

Objective: To create a system that can provide workouts and a good nutrition plan to help the users based on their lifestyle to reach their goals. I am excited about this project because I am a long distance runner so these types of things are some of my biggest hobbies and passions. I've always been a big fan of looking into the analytical side of running so this will definitely satisfy the geek in me as well.

Why this project is important

- Many people struggle finding good workouts and nutrition plans that work personally for themselves, and following what others do may not be the best idea. So this project will help users with this problem
- This project can also help beginners who have never worked out before and are motivated to start. This has a good social impact because the world is moving in a direction where the average fitness and health levels are rapidly decreasing.
- This can also help more advanced users to reach their goals more efficiently

Current Issues:

- Most fitness apps don't have personalized plans for the users and have a more broad approach
- Difficult to integrate data from multiple places and use it effectively
- Lack of data analysis to create fitness and nutrition plans

How this relates to the lectures:

- This project will use things we learned in lecture such as data collection, integration, transformation, analysis, and visualization.

Strategic aspects:

- Collect user data such as age, weight, height, goals, current activity levels, and dietary preferences

- Integrate data from fitness apps, wearable devices, and user input
- Process the data and transform the collected data to create meaningful features like the fitness and nutrition plans
- Analyze the data to look for patterns and the effect of said patterns
- Create a visual representation of the users progress and recommended plans

Plan:

- Types: user profiles, activity data from wearables, dietary preferences
- Sources: Fitness apps, wearable devices, user input forms
- Acquisition: APIs, data import from devices, user surveys

Techniques and Algorithms:

- Collaborative filtering for the recommendations
- Clustering algorithms to group people who have similarities
- Use data such as activity level, dietary needs, fitness goals, age, height, and weight.

Steps and Technologies:

1. Data Collection: Collect data from fitness apps and wearable using APIs like apple health, garmin, etc
2. Data Storage: use a relational database to store structures user data
3. Data Integration: Use ETL processes to merge data from various sources
4. Data Cleaning: use pandas to handle missing values and inconsistencies
5. Data Transformation: Use algorithms to create the features from the collected data
6. EDA: visualize the data trends and distributions using matplotlib
7. Model Building: Create predictive models using algorithms in python
8. Evaluation and deployment: Evaluate performance using metrics like precision and recall. Deploy recommendation system using Flask/Django