Habit Tracking App - Abstract

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Project Goal: To develop a comprehensive habit tracking application as part of a university project, focusing on core functionality, user experience, and innovative features that allow the user to track, correct and analyze their habits.

Technical Approach:

- **Programming Language:** Python was chosen for its versatility and extensive libraries suitable for data manipulation, analysis, and potential machine learning integration.
- **Data Storage:** Habit data and user information are stored in CSV files for easy access and manipulation.
- **Libraries Used:** The project utilizes several key libraries:
  - `Google-generativeai Version:0.8.3` : For potential integration with Google Gemini for advanced habit suggestions.
  - `Pandas Version:2.2.2`: The Library is used for the manipulation of data, the record and tracking of habits and the saving of user and habit data.
- **Testing:** A robust testing framework was incorporated using `pytest` to ensure code quality and functionality, `test_habit.py`.
  - 3 example profiles are also loaded for grader to use for testing purposes.
    - Elias, Julia and Fred are the example user names.
- **Version Control:** Git was used for version control, and the project is hosted on GitHub for collaboration and accessibility.

Key Features:

- **User Management:** The app allows users to create and manage profiles, storing personal data like date of birth and city.
- **Habit Tracking:** Upon logging in users can add, track, and remove habits, specifying the unit of measurement and tracking frequency.
  - For ease of use for user we also created a way to track historical habits incase they missed tracking a habit that they completed.
- **Data Analysis:** Basic analysis features enable users to view their progress, including streaks, averages, and total values for each habit.
  - Get Current number of Habits Currently being tracked.
  - Look at the full habit tracking history.
  - Get the average, total, and # times of tracked values for either ALL historical habits or only current habits.
  - Get a report of habits completed today and still to be completed.
- **Habit Suggestions:** The app includes a placeholder for integrating Google Gemini to provide personalized habit suggestions based on user data and trends.

- **Personalize Motivational 'Greetings'**: Gemini will be called after log in to provide positive reinforcement for the user and provide motivation to continue tracking habits.

Challenges and Reflections:

- **Google Gemini Integration:** Difficulties arose not from implementing the LLM but from ensure it's output would match those provided in unit tests.
- **Error Handling:** This app is sensitive to the spelling of the name of the 'habit' user wants to track. On reflection this could make sense but to make the app more robust in future we could create an id for each habit so it's easy to relate tracking and analysis to habits.
- **JSON for API KEY**: As we look to develop this app for live use for real user we should find better options for the storage of the API KEY for use of Gemini or create a custom version and create a specific call to that dedicated API.
- **Handling User Inputs**: A great challenge during testing was ensuring the user inputs are in the correct format. I try to clearly communicate to user but it would be better to ingest their input and convert to needed format, ie dates.

Future Improvements:

- Further incorporating Gemini is handling messages and providing a clear easy to understand response about why the user got an error and how they can resolve the issue. This could help the user experience making it easy for them to resolve errors.
- Enhance error handling to gracefully manage unexpected input and edge cases.
- Develop a GUI for a more intuitive and user-friendly experience.
- Implement more sophisticated data analysis and visualization features.
- Incorporate features for habit scheduling, reminders, and social sharing, and allow the user to create a 'habit tracking contest' with friends.

GitHub Repository: https://github.com/Brandyn-Ewanek/habit-tracking-app/tree/master