Revision #2
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Overview - BudgetByte

This project is designed to help health and wealth conscious individuals track their grocery spending and compare their food consumption against USDA's MyPlate nutrition guidelines. The main feature is a web application where users can log in, upload or scan grocery receipts, and have the items automatically categorized into major food groups: Fruits, Vegetables, Grains, Protein, and Dairy/Alternatives. Users can monitor their overall monthly expenses and see how much they spend on each category, making it easier to balance dietary needs within their budget.

This project aims to simplify grocery tracking and dietary analysis for users, making the process straightforward while delivering valuable insights.

Key User Stories

As a BudgetByte user, I want to create and access my profile, so my personal data is saved and I don't have to re-enter it every time I use the platform.

Account Creation and Profile Management

- Users can navigate to the login/register page via the "Try it Out" or "Login" buttons on the landing page
- User can register by providing their name, email, and password
- Upon successful account creation, the user is redirected to the dashboard
- Users can login by providing their email and password
- After logging in, the user is directed to the dashboard
- The system stores and persists personal data associated with the user's UID in Firebase.

As a BudgetByte user, after I upload my receipt, I want the system to automatically extract each item name along with price so I don't have to type each in manually.

Parsing Uploaded Receipts with OCR for Item and Price

- When a user uploads a receipt and clicks the "Upload and Parse" button, the system displays a "Processing…" message to indicate that the task is in progress.
- Text extraction is performed using Tesseract.js.
- The raw OCR data is then sent to the OpenAI API for further processing.

As a BudgetByte user, after the system attempts to categorize each item, I want to be able to edit the data, so that I can correct any mistakes in categorization.

Manually Categorizing Food Groups per Item

- Users can manually assign or adjust the food group for each item after the system attempts categorization, allowing for corrections and accurate data.

As a health-conscious user, I want the system to categorize each item from my receipt into specific food groups, so I can see what types of food I am buying.

Automatic Food Group Categorization per Item

- When the raw OCR data is sent to the OpenAI API, the response includes a list of grocery items with fields for item name, item price, quantity, food group, and total price.
- A receipt date is included if detected, or an empty string if not found.
- Manual data validation is performed by comparing the response to the actual receipt.
- Accuracy is high when the OCR data is clear and the receipt image quality is good.

As a health-conscious money saver, I want to see a pie chart representation of my grocery spending by category, so that I can understand how much I spend on different food groups and see if I am eating a balanced diet.

Visualizing Categorized Food Groups

- Display a pie chart showing the spending distribution by food group.
- Show percentage of distribution across Protein, Grain, Dairy, Vegetable, and Fruit for different time frames (per receipt, per month, and lifetime).
- Allows users to hover over the pie chart to view the dollar amount spent on each food group.
- Ensure clear and concise labels for each food group on the chart.

As a money-conscious user, I want to view how much I spend on groceries each month, so I can make informed budgeting decisions.

Monthly Grocery Expense Tracking

- Display total spending for the current month
- Allows users to filter and view expenses by specific months in a year.
- If no data is available for the selected month, display a notification: “No receipts scanned for <month> <year>.”

Known Problems:

- **Tesseract OCR Performance**: Tesseract OCR may struggle to accurately extract text from images when the background is not a simple, uniform color.
- **OpenAI API Classification Issues**: The OpenAI API occasionally misclassifies data such as foodGroup, itemPrice, quantity, and totalPrice. This may occur due to factors like

the exclusion of sales information or specific words in the itemName causing misclassification. When OCR input quality is suboptimal, the output from the API can also be inaccurate.

- **Receipt Total Inconsistency**: The item prices on the dashboard accurately calculate the total, but the analytics page either fails to calculate, fetch, or update the total correctly, often showing a smaller value. This inconsistency occurs even for new users with only one receipt, where both totals should match.
- **Profile Page Rendering Issue**: Refreshing the profile page may result in unexpected rendering behavior, but it subsequently redirects the user back to the dashboard as intended.
- **Analytics Page Redirection Issue**: Refreshing on the analytics page causes an unintended redirect to the login page before correctly routing to the dashboard.
- **CSS Conflicts with "Add New Item" Button**: The "Add New Item" button on the dashboard sometimes displays inconsistent CSS styling due to conflicts in the styling rules.
- **Mobile Responsiveness**: Mobile responsiveness is not fully optimized and may present usability issues on smaller screens.

Product Backlog:

Automatic Food Group Categorization:
As a health-conscious user, I want the system to categorize each item from my receipt into specific food groups, so I can see what types of food I am buying.

- Add functionality for users to edit or create custom food group categories (e.g., snacks, drinks) for a more personalized BudgetByte experience.
- Implement intelligent categorization for food items that may belong to multiple food groups (e.g., cheese as both a protein and dairy item).

Account Creation and Product Management:
As a BudgetByte user, I want to create and access my profile, so my personal data is saved and I don't have to re-enter it every time I use the platform.

- Allow users to share profiles with others for comparison and analysis.

Receipt Data Extraction:
As a BudgetByte user, after I upload my receipt, I want the system to automatically extract each item name along with price so I don't have to type each in manually.

- Develop a mobile app for BudgetByte to streamline the process of uploading receipts directly from the device.

Receipt Image Processing:

As a BudgetByte user, I want the system to accurately extract receipt data even if the image is photographed under varying conditions, so that I don't have to type each detail manually.

- Implement image preprocessing before sending the image to Tesseract.js to improve quality and accuracy.

Mobile Experience:

As a mobile user, I want to access the website on my phone, so that I can access BudgetByte wherever I am.

- Fix mobile responsiveness to ensure a seamless experience across devices.