NEAR EAST UNIVERSITY
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SWE396

"SPENDLESS" AI APP

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Project Report – AI-Powered Budget Planner

Project Overview

This project is a web-based tool that allows users to:

1. **Generate a daily meal & shopping plan** based on a budget and preferences.

2. **Estimate the total cost** of a plan using AI.

It uses **Google's Gemini API** to understand and respond intelligently to natural language prompts.

Technologies Used

- **Frontend:** React
- **Backend:** Node.js + Express
- **AI Model:** Gemini 2.0 Flash API
- **Styling:** CSS
- **Data Exchange:** REST with fetch

Feature 1: Budget to Plan

What it does:
Generates a daily plan consisting of meals, groceries, and cleaning staples based on the user's budget, duration, and dietary needs.

How it works:

1. User Input:
    - Total budget
    - Number of days the plan should cover
    - Dietary preferences (e.g., vegetarian, high-protein, low-carb)
2. AI Instructions (Prompt):
    - Keep the plan within budget
    - Create a formatted daily meal plan
    - Provide a tabulated list of groceries and cleaning materials
    - Indicate if the budget is slightly over or under, within a small acceptable margin
3. AI Output:
    - A day-wise table with meals (breakfast, lunch, dinner)

- A shopping list with estimated prices
- An estimated total cost
- Optional note if the plan exceeds or saves a small amount

4. Presentation:
    - Displayed in an easy-to-read format on the interface

Feature 2: Plan to Budget

What it does:
Takes a user-written plan (e.g., list of meals or cleaning routines) and estimates the total cost.

How it works:

1. User Input:
    - A pasted or typed plan, such as:
        - "Purchase chicken, pasta, milk, and rice."
        - "Eggs in the morning, pasta for lunch, and salad at dinner."
        - "Disinfect the kitchen every 3 days."
2. AI Instructions (Prompt):
    - Estimate the cost of each mentioned item
    - Start the output with a total budget estimate
    - Ignore any unrelated or unlisted content
3. AI Output:
    - Total budget at the top
    - Itemized list with approximate prices

- Clear and concise presentation

4. Presentation:

    - User-friendly format to quickly see whether the plan fits their budget

Feature 1: Budget → Plan

Prompt Sample

```
const prompt = `
Create a meal plan TABLE and shopping list TABLE based on:
- Budget: $${budget}
- Duration: ${duration} days
- Food preferences: "${preferences.food}"
YOU MUST STICK TO THE BUDGET...
`;
```

Route Snippet (/api/plan/generate)

```
router.post('/generate', async (req, res) => {
  const { budget, duration, preferences } = req.body;
  // Generate AI prompt and fetch Gemini response
  // Return structured meal + shopping plan
});
```

Feature 2: Plan → Budget

Prompt Sample

```
const prompt = `
Estimate the total cost of the following plan...
HIGHLIGHT THE OVERALL PRICE AT THE BEGINNING
Plan details: ${plan}
`;
```

Route Snippet (/api/estimate/btp)

```
router.post('/btp', async (req, res) => {
  const { plan } = req.body;
  // Send plan to Gemini API
  // Return estimated budget
});
```

Frontend Snippet: React (Plan Generator)

```
<input type="number" value={budget} onChange={(e) => setBudget(e.target.value)} />
<textarea value={preferences} onChange={(e) => setPreferences(e.target.value)} />
<button onClick={generatePlan}>Generate Plan</button>
<Markdown text={plan} />
```

Frontend Snippet: React (Plan to Budget)

```
<textarea value={plan} onChange={(e) => setPlan(e.target.value)} />
<button onClick={estimateBudget}>Estimate Budget</button>
<Markdown text={budget} />
```

Summary

Feature	Description
Budget to Plan	Outputs realistic shopping/meal plan
Plan to Budget	Estimates real-world cost from input plan
AI Engine	Gemini 2.0 Flash
Frontend Stack	React
Backend Stack	Express.js