Project Report

# Title: AI-Based Grocery List & Recipe Generator from Food Image

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## 1. Introduction

In an age where people frequently see enticing food pictures on platforms like Instagram or YouTube, it's common to wonder: What dish is this? What are its ingredients? How can I cook it? Unfortunately, manually searching for recipes is time-consuming. To solve this, our AI-based system automatically identifies dishes from food images and generates a corresponding grocery list and recipe.  
  
This solution empowers users to plan meals quickly and efficiently, promoting smarter grocery shopping and meal preparation.

## 2. Problem Statement

Modern lifestyles demand convenience. People often come across delicious-looking food images but don’t know:  
- The name of the dish.  
- What ingredients are used.  
- How to cook it.  
  
Our project addresses this gap by allowing users to upload a food image, identify the dish, and automatically generate a grocery list and recipe instructions using AI.

## 3. Project Objectives

- Accept a food image from the user.  
- Use an image recognition model to identify the dish.  
- Use AI to generate:  
 - Ingredients (grocery list).  
 - Step-by-step recipe.  
- Display results cleanly and allow users to download or share the output.

## 4. Technology Stack

|  |  |
| --- | --- |
| Layer | Tools / Frameworks |
| Frontend | HTML, CSS, JavaScript |
| Backend | Flask (Python) |
| AI Image Model | Gemini API key |
| Text Generator | gemini |
| PDF Generation | ReportLab (Python) |

## 5. Implementation Details

Step-by-Step Process:  
1. Image Upload: User uploads a food image via the web interface.  
2. Image Analysis: The image is encoded and processed using a pre-trained vision model or CLIP-based embedding.  
3. AI Prompting: The classified dish name is sent to OpenAI GPT, which returns a structured recipe.  
4. Display & Output: Dish name, grocery list, and recipe steps are shown.  
5. PDF Export: A professional PDF of the grocery list and recipe is generated using ReportLab.

## 6. Project Timeline

|  |  |
| --- | --- |
| Date Range | Task |
| July 2 – 3 | UI design and image upload feature |
| July 4 – 6 | Image classification model integration |
| July 7 – 9 | OpenAI API connection for grocery list generation |
| July 10 – 12 | Response display & UI/UX polishing |
| July 13 – 14 | Final testing and bug fixing |
| July 15 | Final report submission and demo |

## 7. Features & Output

- Upload food image  
- Auto-identify dish name  
- Generate full ingredient list  
- Provide recipe steps  
- Download/Share shopping list  
- Clean and mobile-friendly UI

## 8. Future Enhancements

- Voice-based recipe assistant  
- User profile & upload history  
- Nutritional information estimation  
- Multilingual support  
- Integration with grocery delivery APIs

## 9. Conclusion

This project demonstrates how artificial intelligence can be applied to daily life, especially in automating food-related decisions. With just a picture, users can now generate a complete grocery list and cooking steps—saving time and enhancing culinary exploration.  
  
This is a scalable solution with real-world utility in smart kitchens, cooking apps, and health planning.