

Binny & Bloom

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Problem

- Many times, people are left with food waste, whether it be egg-shells or some old vegetables, people tend to just throw them away without a second thought.
- Food waste, however, can contribute to greenhouse gas emissions and other environmental challenges that have a substantial impact on mankind.

Target Users :

- Anyone interested in learning how to properly dispose of or recycle food waste.
- Track expiration dates, and provide locations for donating food (such as shelters, food banks, etc.).

Social impact goal

- The Krusty Compost Crew goal is to Help to improve society by reducing waste one at a time.





Why AI

Composting Guidance – Instead of a generic “compost this” AI can give:

- Category-specific composting instructions
- Warning, such as “don’t compost meat in a backyard bin”
- Tips for reducing waste next time

Meal suggestions to prevent waste – If something is expiring soon, AI can:

- Suggest recipes
- Use multiple items at once
- Filter by dietary preferences
- Example suggestion:
 - “Your tomatoes and spinach expire in 2 days. You can make a pasta using both.”

Donation Eligibility Reasoning – Food banks have rules for donations:

- No opened items
- No expired items
- Some accept perishables, some don’t
- Some accept produce only if it’s fresh

AI is used to sort items for the donations:

- Item category
- Condition
- Time until expiration
- Donation site policies
- This would be more flexible than hard-coded.

Model / System Plans

Model (GenAI)

- LLM accessed via the OpenRouter API
- OpenRouter/free will automatically pick a free model for LLM usage
 - Python to build backend
- SQLite to store food inventory info including names, categories, quantities, best by dates, etc.

Grounding

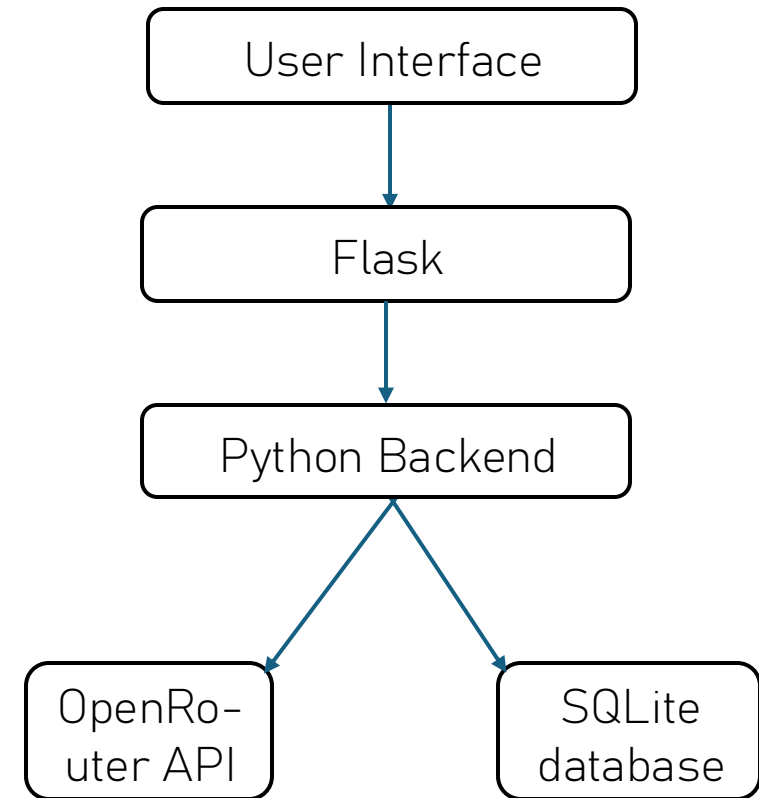
- Model **will not** invent inputs
- Ingredients come only from SQLite database
- Donation locations come from only known APIs
- Expiration urgency is computed only by backend logic



Model / System Plans

Hallucination Mitigation

- The model will be constrained
- Only for content generation, not decision-making
- Prompts will be used so only uses provided ingredients
 - Avoids food safety or handling advice/nutritional claims
- Backend validation so AI output never written directly to database
- AI output displayed as suggestions and labeled as AI-generated



Data Plan

- Data that will be collected in expiration dates of products, the product obtained by user.
 - AI will create recipes and recycles methods for user.
- User Account: Personal information such as full name, email and password & location will be encrypted for privacy.
- If expiration date is detected incorrectly, user will be able to manually input it in.

MVP Scope – Milestone 2 (March 4)

Front-end

- Set up a working website, that displays and returns expected data.
- Make the website immersive, so users are left with an impression.

Back-end

- Set up SQLite database
- Functional basic CRUD operations
- Implement expiring soon flags to DB (ex. 3-day threshold for expiration notification)

AI Integration

- Set up OpenRouter API
- Send list of expiring ingredients to the model
 - Receive recipe suggestions / friendly alerts / recycling ideas
- Handle API responses safely (check for errors, fallback text if API fails)
- Test LLM output with sample inventory data

Risk & Ethics

- Ethical Issues
 - Privacy – handling user login info, user shopping habits
 - Bias – AI not recommending meal options for different cultures
- Safety
 - Food Safety – AI providing harmful recommendations
- Risks/Misuse
 - System Errors – recommendation errors, incorrect user input, slow loading time, data loss
 - Abuse of Data – an attacker gaining unauthorized access to user data

Success Metrics & Evaluation Plan

Metric	Success Criteria	Evaluation
Functional Correctness	User can add/view food items, expiration logic works, AI suggestions generated	Verify CRUD operations and expiration detection with test data
AI Output Quality	LLM outputs reference actual inventory items and provide coherent recipes or expiration alerts	Manually review LLM outputs against expected ingredients and scenarios
System Reliability	System can handle LLM/API failures without crashing and shows error messages	Simulate errors and confirm graceful degradation of system
Performance	Inventory actions are near instant, AI responses within reasonable time	
Usability	User can complete core tasks without instructions	Informal walkthroughs with classmates, friends, or family not working on project to assess ease of use

Team Roles

Location	Team Members (tentative role assignment)
Frontend	Luis
Backend	Emma
Hybrid	Taja, Jay, Abby

Timeline

