

GRADUATE PROJECT PROPOSAL



BRIDGEWATER STATE UNIVERSITY
Department of Computer Science
Summer 2025

Project Title:

MindfulBite – Food Choice Navigator

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Table of Contents

1. Description
2. Goals
3. Abstract / Statement of Purpose
4. Research Methods
5. Action Plan
6. Tentative Schedule
7. Software and Platforms
8. Bibliography
9. Grading

DESCRIPTION

This project proposes the development of a web-based application called MindfulBite, designed to help users find food alternatives tailored to their needs. The application will take a user's food input and provide a data-backed analysis of its pros and cons, followed by personalized recommendations based on selected filters (e.g., health-conscious, eco-friendly, religiously appropriate, or lower calorie options). It will leverage publicly available nutritional datasets to inform its logic. The tool aims to promote awareness about food choices and support healthier, more mindful consumption habits.

GOALS

- To create a web application that accepts food item inputs from users.
- To suggest healthier alternatives based on user preferences.
- To display a comparison of the nutritional profile of the entered food and the suggested alternative.
- To build the project using Python and SQL with minimal external dependencies.
- To ensure modularity so features can be added or improved in future phases.

ABSTRACT / STATEMENT OF PURPOSE

The purpose of this project is to create a food awareness and suggestion tool that can help users make better eating decisions. When I first moved to the U.S., I was unfamiliar with the nutritional content of many local foods. As a result, I gained significant weight and experienced health changes. Only after speaking with others did I realize how common this experience is, especially when people move to a new place or are introduced to unfamiliar cuisines. This inspired me to build an application that helps users understand what they are eating, compare it with better alternatives, and make informed decisions. Whether someone wants a food suggestion based on their dietary restrictions or is simply craving something sweet or salty, this tool aims to provide a meaningful recommendation. The primary goal of the application is to raise awareness

among users about how significantly their daily food choices can impact their overall health.

RESEARCH METHODS

The project will be built using Python for backend logic Flask for the user interface. Data will be extracted from trusted sources like:

- USDA FoodData Central
- Tufts University Food Compass
- Tufts Diet and Cost Database
- Harvard Nutrient Data

Initially, food alternatives will be suggested using basic rule-based logic (e.g., replacing "chips" with "popcorn" for health reasons). Over time, user filters and dataset tagging will support more dynamic and accurate suggestions.

ACTION PLAN

Instructor and student will have a bi-weekly meeting in order to:

- Discuss and present the project's progress.
- Discuss and plan the next steps needed to be taken in the following weeks.

TENTATIVE SCHEDULE

Week	Tasks
Week 1	Research available datasets and APIs. Define core requirements
Week 2	Design database schema and data models; Set up API connections
Week 3	Develop core Python backend; Implement basic food matching algorithm
Week 4	Implement nutritional comparison logic

Week 5	Begin frontend development with Flask and Create basic UI components
Week 6	Integrate backend with frontend
Week 7	Making sure of combining the datasets
Week 8	Conduct comprehensive testing. Fix bugs and optimize performance
Week 9	Implement final refinements. Prepare documentation
Week 10	Final testing. Submission of project report and presentation

SOFTWARE AND PLATFORMS

Backend Development

- Python: Core programming language for data processing and application logic

Frontend:

- Framework: HTML, CSS, and basic JavaScript
- Styling: CSS Flexbox/Grid

Backend:

- Framework: Flask (Python)

Database:

- SQL

Development Environment:

- Visual Studio Code: Primary IDE with Python extensions
- GitHub: For code repository and project management

BIBLIOGRAPHY

- USDA FoodData Central API Documentation – <https://fdc.nal.usda.gov/api-guide.html>
- Tufts Food Compass – <https://sites.tufts.edu/foodcompass/>
- Harvard Nutrition Source – <https://www.hsph.harvard.edu/nutritionsource/>
- Dietary Guidelines for Americans 2020–2025 – <https://www.dietaryguidelines.gov/>
- Flask Documentation – <https://flask.palletsprojects.com/>

GRADING

- **Grade A (A, A-):** The project demonstrates full implementation of all core features, includes a user-friendly and good interface, and provides a well-documented codebase along with a comprehensive final report.
- **Grade B (B+, B, B-):** The project meets all listed goals, but may have an incomplete or basic user interface, or lack thorough documentation. The final report is generally well-structured and effectively communicates the project.
- **Grade C (C+, C, C-):** The system is only partially functional or unstable. The final report lacks clear structure and does not sufficiently explain the project's purpose or outcomes.
- **Grade F:** The project is non-functional and no final report is submitted.