

Project Outline And Plan

Recipe Recommendation, Visualisation and Collation Web Application

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1 Introduction

The aim of this project is to develop a web-application which provides its user with access to a large collection of recipes. The web-application will use machine learning techniques to create visualisations of these recipes as a graph of nodes, encouraging the exploration of new ingredients and recipes.

The user will be able to submit their own recipes to the website and rate those they come across, allowing them to receive personalised recommendations of recipes they may be interested in. Furthermore, the user will be able to form "friendships" with other users to see the recipes that friends upload or like themselves.

The user can select several recipes to build a 'meal plan', which will have a corresponding shopping list containing the ingredients required to make these meals.

2 Aims, Objectives and Deliverables

2.1 Project Aims

This project aims to incorporate web technologies and machine learning to produce a web-application delivering personalised recommendations to its users. Visualisation techniques will be used to display both the result of clustering recipe documents and the relationships between ingredients across different recipes.

2.2 Objectives

The objectives of this project involve developing:

- A front-end for the web application
- A back-end for the web-application
- A machine learning back-end API which delivers personalised user recommendations

2.3 Deliverables

The project will comprise the following deliverables:

- A repository containing the code for the web application, including:
 - A web front-end which displays the application's data and allows the user to interact with the back-end APIs
 - A web back-end API which delivers the data required to render the front-end
 - A machine-learning back-end API which delivers personalised user recommendations

- A final report summarising the development of the codebase

3 Project Plan

A plan is given for each distinct part of the project. These plans will be executed simultaneously.

Web Front-End

- Identify web-pages using user stories
- Identify required end-points for each web-page
- Develop end-to-end and UI tests using user stories
- Identify framework to use
- Research graph visualisation on web-pages
- Develop front-end components

Web Back-End

- Identify framework to use
- Develop unit tests for end-points
- Develop endpoints identified in Front-End Development

Machine Learning Recommendation

- Research recommendation systems
- Implement different approaches
- Evaluate performance
- Make accessible to web back-end

3.1 Timeline

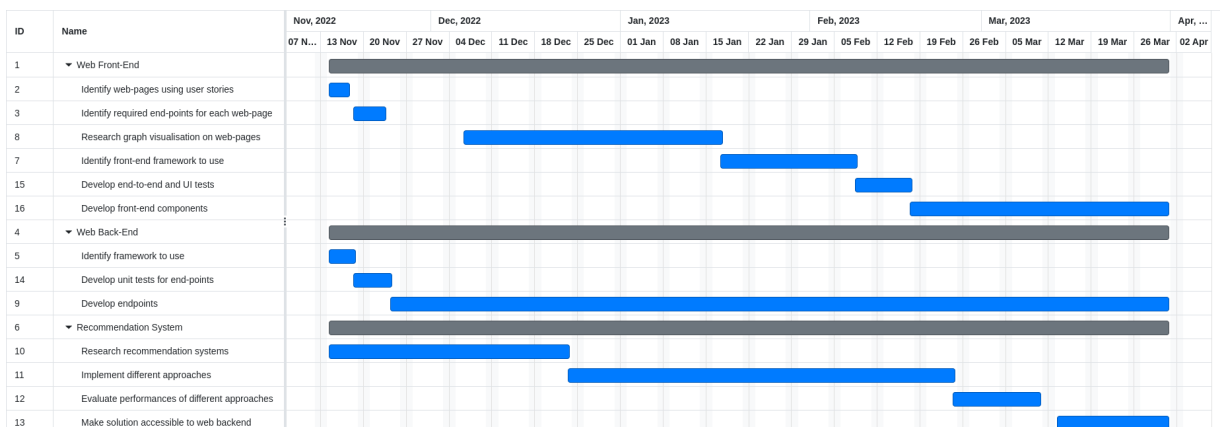


Figure 1: Gantt Chart Depiction of Project Plan

4 Risk Mitigation

The project's development faces several risks:

- Rendering the graph visualisations
 - There is a large amount of data so optimising for performance may be difficult.
 - It is unclear how many existing solutions exist that could be suitably adapted for the task at hand to ensure all desired functionality is met.
- Machine learning recommendation
 - Machine learning has few guarantees and it is certainly feasible that a recommendation system may deliver unsatisfactory recommendations.

5 Ethics

There are several ethical issues involved in the project:

- Collection of user data - personal data including email addresses and passwords will be collected, alongside inferences made about users' preferences.

This will be mitigated by ensuring the project complies with the Data Protection Act, storing and deleting user data as required.

- The project involves a large quantity of unmoderated data. It will include systems that allow for the submission of new text which will become publicly available to others using the application.

This risk will be mitigated by allowing users to report offensive content, flagging it for review and potential removal.

- The project allows users to indirectly interact with others through a friendship system and submission of unmoderated content.

To ensure that users can prevent unwanted communication from others, they will be able to block other users from making any direct or indirect communication with them.