Initial Plan
MyBookChoice

A READING BOOKS RECOMMENDER ALGORITHM AND WEBSITE

CM3203: ONE SEMESTER INDIVIDUAL PROJECT

SCHOOL OF COMPUTER SCIENCE AND INFORMATICS

CARDIFF UNIVERSITY

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Description

It is said that books allow traveling without the use of feet, as reading, spreads wings to our imagination and aids in developing a wide variety of skills, transforming one's life. In our modern technological world, people often struggle in deciding what book to read next or are unaware of what new books have been published.

The main goal of this project is to construct a recommender system in the form of a website that employs several recommendation algorithms to obtain, analyse and return to the user the best results of suggested books based on different criteria and preferences they have chosen. To obtain, analyse and return those results, the application will use information from the user such as their age group and also, through engagement from the user by selecting past books they read, reviews, and favourite genres. As user engagement with the application increases, the algorithm will be enhanced, resulting in more accurate recommendations for the user's preferences. Lastly, the user will have the ability to search and display all the books available.

Ethics

For the purpose of making decisions on the recommendation algorithm that will be created and the overall design of the system, human participation will be required to obtain various opinions and insights. In addition, participant involvement will also be beneficent in evaluating the design's usability, functionality, and the objectives of the final prototype of the application.

I will use one data collection method to gather data from my participants which will be through online surveys that would provide me with quantitative data and assist in obtaining statistical and graphical data. Both surveys will be separated into two sections (consent and survey section) and will be comprised of 10-15 different types of questions such as multiple-choice, dropdown, open-ended, ranking, and Likert scale questions.

Before distributing the survey to participants, I will have to undertake the research integrity online training course for students provided by Cardiff University and then create an application form, participant information sheet, and a participant informed consent form which will require approval from Cardiff University's COMSC Research and Ethics Group.

Aims and Objectives

Fundamental Aims and Objectives

The fundamental aims and objectives are important goals set to achieve the implementation of an efficient and practical web application.

1. Design a comfortable, simple, easy to use and navigate front-end user interface for the user, to see and allow ease in interaction and predictability.
2. Implement a maintainable and integrated back-end API that acts as a basic requisite configuration for the server-side and database of the web application as it 'fuels' the front-end.
3. Design a coherent database that would store and handle user and books data efficiently and maintain integrity.
4. Implement a functional recommendation algorithm that would provide accurate recommendations which is indispensable for the overall application.

Desired Aims and Objectives

The desirable aims and objectives are goals that come secondary but will significantly improve the application as they are less critical in the development process.

1. Achieve high Lighthouse scores, above 70% for the evaluations of performance, accessibility, best practices, SEO, and PWA.
2. The web application should be 'translated' effectively via various web browsers, such that it can be compatibly accessed by and is fully functional for any user.
3. The overall system should allow scalability in the future and be able to handle an increase in users and load, and also be able to efficiently handle more and more requests per minute.
4. The final implementation could be deployed on a virtual private server under its own domain to enable access worldwide.

Technologies and Methodologies

1. Agile Software Development Methodology

For the software development process, I have decided to use the Agile Manifesto as it provides more freedom, quickly adapts, and allows changes at very little cost. As the application will have many dependencies, this methodology enables to periodically check that the application satisfies what is envisioned.

2. Representational State Transfer

The application will be separated into a back-end API and a front-end MVT pattern to provide a flexible and lightweight way to integrate between each side. This will allow changes to be made on the client-side without affecting the server-side operations.

3. Django Framework

The Django framework, which is a high-level Python web framework, will be used which follows MVT architecture pattern and allows building securable, scalable, and versatile web applications. This will also provide a powerful automatic administration interface that will be used to manage content on the application.

For the back end, Django's REST framework will be used which is a flexible toolkit for building Web APIs. It includes highly customizable packages, allows URL structure defining, and supports a wide range of media types.

4. Bootstrap Framework

For the front end, the Bootstrap framework will be used which consists of HTML, CSS, and JavaScript. It will allow the creation of a highly compatible and customizable responsive design.

5. MongoDB Database

MongoDB will be used to store user, book, and all the data of the application, which is a schema-less, cross-platform database program. MongoDB is highly flexible, very easy to scale, and allows fast access to data and it is.

Risk Assessment

Risk Analysis

Risk Number	Risk Factor	Risk Severity	Risk Likelihood	Risk Treatment
1	Data Loss	Large	Low	The application's work will be frequently backed up on a version control system such as GitHub and the documentation on both Google Drive and OneDrive.
2	Falling Behind Schedule	Large	Medium	Create an efficient work plan and provide an additional time period to prevent this unpredictable event.
3	Illness	Moderate	Medium	Due to the COVID-19 global pandemic, it is important to sanitize and wear face protection to reduce the chances of infections. Wear warm clothes when needed and take multivitamins to strengthen my immune system.
4	Application Vulnerability	Large	Medium	Implement strong security for the application and encrypt sensitive data. Design database to handle a large number of users.
5	Low Productivity	Moderate	Low	Optimize workflow and day-to-day schedule, spend some time doing extracurricular activities to exercise, keep lucid and motivated.

Risk Map

Occurrence Likelihood / Severity	High	Medium	Low
Large		**2, 4**	**1**
Moderate		**3**	**5**
Small			

Work Plan

Week 1: 31/01 – 06/02	• Research similar solutions, design methodologies, recommendation algorithms, development software, and database schema. • Set-up task planner. • Weekly meeting with supervisor (02/02) – discuss initial plan document. • Work on initial plan document structure, cover page, description, aims, technologies. Then, create a work plan and Gantt chart. • Send initial plan to supervisor and receive feedback. Adjust final changes to the initial plan.

Week 2: 07/02 – 13/02	• Submit initial plan. • Begin design stage by preparing survey questions. • Weekly meeting with supervisor (11/02) – discuss the survey and then make an application to COMSC Research and Ethics Group.
Deliverables:	Initial Plan (07/02), survey application.
Milestone:	Initial Plan completion.

Week 3: 14/02 – 20/02	• Create user personas and gather functional & non-functional requirements. • Weekly meeting with supervisor (18/02) – discuss figures and requirements created and gathered. • Create use cases.
Deliverables:	User personas, functional & non-functional requirements, use cases.

Week 4: 21/02 – 27/02	• Create a UML diagram, state transition networks. • Weekly meeting with supervisor (25/02) – discuss figures created. • Wireframe an initial prototype and design an appropriate database model.
Deliverables: Milestone:	UML diagram, STN's, initial prototype, database model. Design Stage completion.

Week 5: 28/02 – 03/03	• Distribute the survey to participants, gather results, and analyze. • Weekly meeting with supervisor (04/03) – discuss results and their analysis.
Deliverables:	Results and analysis

Week 6: 07/03 – 13/03	• Setup and work on back-end Django API environment. • Implement and integrate the MongoDB Database to the API. • Weekly meeting with supervisor (11/03) – discuss database and overall progress.
Deliverables:	MongoDB Database

Week 7: 14/03 – 20/03	• Create a front-end environment. • Begin recommendation algorithm development. • Weekly meeting with supervisor (18/03) – discuss and review algorithmic improvements.

Week 8: 21/03 – 27/03	• Continue work and finish recommendation algorithm development. • Weekly meeting with supervisor (25/03) – discuss and review project progression. • Begin work on back-end development. Work on models, routing, views.
Deliverables: Milestone:	Recommendation algorithm. Recommendation algorithm completion.

Week 9: 28/03 – 03/04	• Continue work on back-end development. • Weekly meeting with supervisor (01/04).

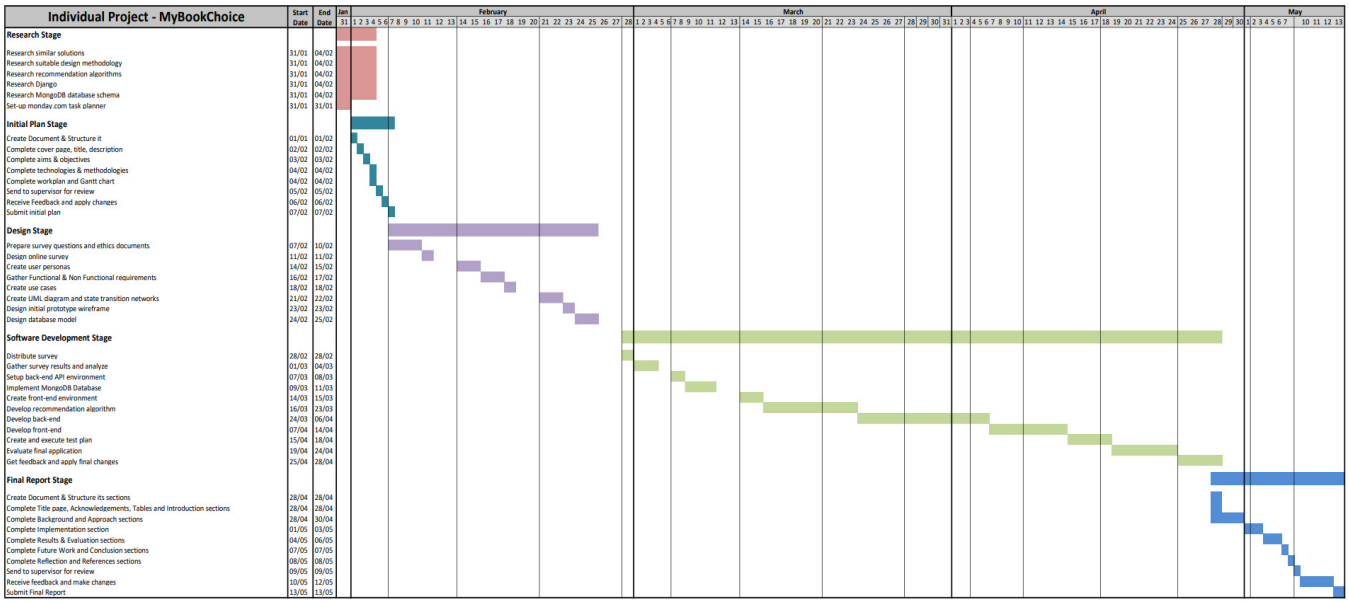
Week 10: 04/04 – 10/04	• Implement recommendation algorithm to the back-end and finish its development. • Weekly meeting with supervisor (08/04) – discuss and review project progression. • Begin front-end development of responsive templates and user interface.
Milestone:	Back-end completion including API and recommendation algorithm.

Week 11: 11/04 – 17/04	• Complete work on all front-end development pages. • Weekly meeting with supervisor (15/04) – discuss and review UX techniques used. • Create a test plan for the web application.
Milestone:	Front-end client completion.

Week 12: 18/04 – 24/04	• Execute test plan and obtain results. • Weekly meeting with supervisor (22/04) – discuss the test plan and validity of results. • Evaluate the final application.
Deliverables:	Test plan, results, and evaluation.
Milestone:	Development Stage finished, application completed, tested, and evaluated.

Week 13: 25/04 – 01/05	• Get feedback and apply final changes. • Weekly meeting with supervisor (29/04) – discuss the final report. • Create final report document and structure. Complete title page, acknowledgments, figure tables, and introduction sections. • Complete background, approach, and implementation sections.
Deliverables:	Final report title page, acknowledgments, tables, introduction, background, approach, and implementation.
Milestone:	Final report first sections completion.

Week 14: 02/05 – 08/05	• Complete results & evaluation, future work, conclusion, reflection, and references sections. • Weekly meeting with supervisor (06/05) – discuss final report progress. • Send to supervisor for review.
Deliverables:	Final report results & evaluation, future work, conclusion, reflection, and references.
Milestone:	Final report completion.

Week 15: 09/05 – 13/05	• Receive feedback and make changes. • Weekly meeting with supervisor (10/05) – discuss overall project. • Submit Final Report.
Deliverables:	Completed Final Report.
Milestone:	Final Report submission (13/05).

Gantt Chart