Project outline and specification

● Graded

Student

Abdul Rafay

Total Points

32 / 34 pts

Question 1

Project title

2 / 2 pts

✔ **– 0 pts** The title is appropriate and suitably concise.

– 1 pt The title could be edited or slightly improved to improve the focus

– 2 pts The title does not have an appropriate computer science focus

Question 2

Project aim

2 / 4 pts

– 0 pts The aim is appropriate and describes a suitable computer science problem.

✔ **– 2 pts** The aim is clear but requires more detail on the problem being solved.

– 3 pts The idea is described but is vague and requires a clearer focus.

– 4 pts The aim is unclear and requires a more detailed description of the problem being solved.

Question 3

Project objectives

8 / 8 pts

✔ **– 0 pts** Objectives are all appropriately specified.

– 4 pts Some objectives are appropriate. Most should be clarified and related to the overall aim of the work.

– 2 pts Most objectives are appropriate. Some should be clarified and related to the overall aim of the work.

– 6 pts The objectives as a whole should be stated more clearly as an outcome of your work on the project.

– 8 pts These are not appropriate as objectives. Please see the general advice that was circulated.

Question 4

Project deliverables

8 / 8 pts

✔ **– 0 pts** These are an appropriate set of deliverables.

– 2 pts Most deliverables are appropriate but some should be linked more clearly to an objective.

– 4 pts Some deliverables are appropriate but most should be linked more clearly to an objective.

– 6 pts The deliverables overall are not clearly specified as something you will produce during the project.

– 6 pts The deliverables as a whole should be stated more clearly and related to the objectives of your project.

– 8 pts These are not appropriate deliverables. Please see the general advice that was circulated.

Question 5

Project plan

4 / 4 pts

✔ **– 0 pts** The plan is appropriate and at the right level of granularity. It accounts for completion of the work, evaluation and writing up.

– 1 pt The plan captures the work required but needs more detail to be certain of completion.

– 1 pt The plan does not capture all the work required: implementation, evaluation and writing up.

– 2 pts The plan is at too high a level to be certain of completion.

– 3 pts The plan is unrealistic and does not adequately capture the work that is required.

– 3 pts The plan is not organised systematically or presented appropriately.

– 4 pts No plan is provided.

– 1 pt The plan has unnecessary details

– 2 pts The plan estimated wrong timeline

Question 6

Risk mitigation

4 / 4 pts

✔ **– 0 pts** The important aspects of risk are described and sensible mitigations are discussed.

– 1 pt Risks are described appropriately but without consideration of how to mitigate risk

– 2 pts Some risks are considered but in quite a generic way

– 3 pts There is no, or very limited, discussion of risk and no real discussion of strategies to mitigate the risk

– 4 pts There is no real discussion of strategies to mitigate the risk.

Question 7

Ethics

4 / 4 pts

✔ **– 0 pts** The important ethical issues of this work are described.

– 0 pts We agree that there are no ethical issues associated with this work.

– 1 pt Limited discussion of ethics with some areas not considered.

– 2 pts Ethical issues are described but not how you will handle them properly during the work.

– 3 pts You have stated that there are no ethical issues but we do not consider this to be correct.

– 4 pts No, or only limited, discussion of ethics with no real focus on the work to be completed.

Q1 Project title
2 Points

The title should be concise but also should adequately describe the subject of your project.
General advice is to avoid phrases such as "An investigation of...", " A study of..." etc.

AI Recommender System with a Modular Design

Q2 Project aim
4 Points

A short paragraph describing the computer science problem that your project is investigating.
This does not need to describe how you solve the problem or with what tools, unless that is fundamental to the work.

My project explores the challenge of developing a flexible and scalable recommendation system that works across a variety of distinct domains without being limited by domain-specific traits. It focuses on designing a modular architecture that separates the core recommendation functionality from the unique features of each domain, enabling the system to adapt smoothly to different datasets with their own specific attributes. The project investigates approaches for accurately capturing and integrating user preferences in a way that is not tied to any particular domain, ensuring that recommendations remain personalised and relevant across different product categories. By addressing these issues, my project aims to improve the versatility and usefulness of AI-driven recommender systems for different environments.

Q3 Project objectives
8 Points

A list of up to 5 objectives that you will achieve as part of your project. You do not need 5, 3-5 is usually appropriate.
These objectives will collectively meet the overall aim of your work.
Normal parts of the project such as literature review, background research and report writing are not objectives.

Develop a Core Recommendation System - Create a central system that manages key recommendation tasks such as feature extraction, similarity scoring, and filtering, ensuring it operates independently of any specific domain

Design Domain-Specific Modules - Build separate modules for different product categories (e.g., perfumes, badminton rackets, crisps) that handle unique features and characteristics, allowing the core system to process diverse types of data effectively

Implement a Flexible Data Integration System - Set up a system that can easily incorporate and switch between various datasets by defining and managing domain-specific attributes. I will ensure that the recommendation logic remains the same across different systems

Establish an Evaluation Framework - Create methods to assess the system's performance and user satisfaction through rating systems, simulated user profiles, and A/B testing, ensuring the recommendations are accurate and if the user is happy with them

Q4 Project deliverables
8 Points

A list of up to 5 deliverables from your project. Two of these should be your report itself and your software repository.
Deliverables are concrete items produced during your project. They are the evidence that you require to meet your objectives, and ultimately your aim. You should link them to your Objectives in the text below such that it will be clear which Deliverable relates to which Objective.

1. **Report**

   Write the report detailing the research, design, implementation, and evaluation of the AI-powered recommender system. My report will outline the problem statement, objectives, methodologies, results, and conclusions of the project.

   Linked Objective: All project objectives are covered within the report

2. **Software Repository**

   A fully functional codebase of the developed recommender system, including the core recommendation engine, domain-specific modules, and the evaluation framework. The repository will also contain documentation, installation instructions, and usage guidelines.

   Linked Objective:

   - **Develop a Core Recommendation Engine**
   - **Design Domain-Specific Modules**
   - **Implement a Flexible Data Integration System**

3. **Core Recommendation Engine**

   The central component of the system that handles essential tasks such as feature extraction, similarity scoring, and filtering. This engine operates independently of any specific domain, ensuring versatility across different datasets.

   Linked Objective: **Develop a Core Recommendation Engine**

4. **Domain-Specific Modules**

   Separate modules tailored for various product categories like perfumes, badminton rackets, and crisps (examples). These modules manage unique

features and characteristics specific to each domain, enabling the core engine to process diverse data effectively.

Linked Objective: **Design Domain-Specific Modules**

5. **Evaluation Framework**

A set of tools and methodologies for assessing the performance and user satisfaction of the recommender system. This includes rating systems, simulated user profiles, and A/B testing setups to ensure the recommendations are accurate and meet user needs.

Linked Objective: **Establish an Evaluation Framework**

Q5 Project plan
4 Points

A schedule for your project from now until the final submission of the report (week 10 of semester 2).
Weekly is probably an appropriate level of planning for most people.
This is best presented as an itemised list of Weeks and planned, headline achievements.
You can also upload a chart or other document.

Semester 1
Week 6 (8 Nov - 14 Nov)

Finalise project scope and objectives.
Week 7 (15 Nov - 21 Nov)

Begin literature review on recommender systems.
Week 8 (22 Nov - 28 Nov)

Develop initial core recommendation engine.
Week 9 (29 Nov - 5 Dec)

Continue building the core engine.
Week 10 (6 Dec - 12 Dec)

Start designing domain-specific modules.
Week 11 (13 Dec - 19 Dec)

Develop first domain-specific module (e.g., perfumes).
Week 12 (20 Dec - 26 Dec)

Integrate core engine with domain-specific modules.
Week 13 (27 Dec - 2 Jan)

Set up data integration system.
Semester 2
Week 1 (3 Jan - 9 Jan)

Design evaluation metrics and methods.
Week 2 (10 Jan - 16 Jan)

Implement rating system for user satisfaction.
Week 3 (17 Jan - 23 Jan)

Conduct integration testing of the system.
Week 4 (24 Jan - 30 Jan)

Develop simulated user profiles for testing.
Week 5 (31 Jan - 6 Feb)

Start A/B testing with different system versions.
Week 6 (7 Feb - 13 Feb)

Analyse A/B testing results.
Week 7 (14 Feb - 20 Feb)

Refine recommendation algorithms based on feedback.
Week 8 (21 Feb - 27 Feb)

Finalise evaluation framework and conduct tests.
Week 9 (28 Feb - 5 Mar)

Begin drafting the final dissertation report.
Week 10 (6 Mar - 12 Mar)

Complete and review the dissertation draft.
Week 11 (13 Mar - 19 Mar)

Make final adjustments to the system and report.
Week 12 (20 Mar - 26 Mar)

Submit at end

No files uploaded

Q6 Risk mitigation
4 Points

A brief discussion of how to mitigate risk in your project and ensure sufficient work will be completed for final submission.
This could include prioritisation of objectives and deliverables or development of prototypes as early-stage deliverables.

The core recommendation engine and domain-specific modules are foundational to the system, so their development will take precedence. By focusing on these primary components early on, issues can be identified and addressed before progressing to more complex tasks. Similarly, delivering the final report and software repository are critical milestones that will be planned well in advance to avoid last-minute rushes.

Development of Prototypes - Creating prototypes at the early stages of the project is another effective risk mitigation strategy. An initial prototypes of the core engine and one domain-specific module will be developed to test the feasibility of the modular architecture. A prototype would provide valuable insights and allow for iterative improvements, ensuring that the final system is robust and well-designed. Early-stage prototypes are good for better understanding of the system's requirements and challenges.

Regular Supervisor Meetings and Feedback - Regular meetings with the supervisor every two weeks will help keep me on track. These check-ins provide opportunities to receive timely feedback, make necessary adjustments, and stay aligned with the project's objectives. By maintaining open communication with the supervisor, any deviations from the plan can be identified and fixed.

Q7 Ethics
4 Points

Describe the ethical issues associated with your project and how you will address them.
For example, proper handling of data sets, user testing, etc.
If you believe there are no ethical issues associated with your project you should state that here.

The main ethical concerns associated with my project include data privacy, data security, bias and fairness, and informed consent during user testing.

Data Privacy

The recommender system relies on user preferences and feedback to provide personalised recommendations. To protect users' privacy:

Anonymisation: All user data used in the system will be anonymised to prevent the identification of individual users.
Data Minimisation: Only the necessary data required for the functioning of the recommendation engine will be collected and processed.
Compliance with Regulations: The project will adhere to relevant data protection laws, such as the UK Data Protection Act, ensuring that users' personal information is handled legally and ethically.

Data Security
Ensuring the security of the data is essential to prevent unauthorised access and potential data breaches.

Secure Storage: User data will be stored in secure databases with appropriate encryption methods to safeguard against unauthorised access.
Access Control: Only authorised personnel involved in the project will have access to sensitive data, minimising the risk of data misuse.