Project Proposal

Title:

AI-Powered Consumer Behaviour Analysis with Integrated Recommendation System and Conversational Chatbot

Team Members:

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Problem Statement

Traditional recommender systems suggest products but do not provide an interactive experience. Chatbots can answer queries, but they are not always connected with personalized recommendation engines. Also, consumer behaviour analysis is not directly integrated into such systems.

So, the problem is:

- How to build a system that not only recommends products but also interacts naturally with users through a chatbot?
- How to capture and analyze the consumer's choices and behaviour during these interactions?

Objectives

- To design a recommender system that can suggest products using available datasets.
- To build a chatbot that can interact with users and connect with the recommender engine.
- To log consumer interactions and analyze behaviour trends.

Datasets

- Public datasets such as Amazon or Flipkart reviews, MovieLens (for prototyping).
- Simulated user data (if real users are involved for testing chatbot interactions).

Approach & Methods

- **Recommender System:** Collaborative Filtering + Content-Based Filtering using Python (scikit-learn, Surprise).
- **Chatbot:** Rasa, LangChain, or OpenAI API for natural language interaction.
- **Consumer Behaviour Analysis:** Python (pandas, matplotlib, seaborn, nltk) to study trends, sentiment, and recommendation acceptance.
- **Integration:** Flask/Django for web-based interface, MySQL/MongoDB for logging queries and interactions.

Evaluation Plan

- **Recommender Accuracy:** Precision@K, Recall@K, RMSE.
- **Chatbot Effectiveness:** Query response accuracy, relevance of recommendations.
- **Behaviour Analysis Validation:** Identification of meaningful trends from logged interactions.

Expected Outcomes

- A working recommender system integrated with a chatbot.
- Logging system to capture consumer interactions.
- Analytical module producing behaviour insights.
- Web-based demo showcasing the system and consumer behaviour dashboard.

Team Roles and Timeline

Roles:

- Student 1: Recommender system, backend integration, behaviour analysis ,visualization.
- Student 2: Chatbot development, frontend interface.

Timeline (Milestones):

- Proposal – 10 Sept
- Data Collection & EDA – 22 Sept
- Baseline Model – 6 Oct
- Intermediate Report & Code – 17 Oct
- Final Report & Presentation – Nov