Team Charter Template

Last updated: 2024-11-17

Team Name: Few-Shot Learning for Low-Frequency Product Categorization in E-commerce Data.

Team Members:

- Sylvester Ampomah
- Bandaluppi Sai Sowmya

1. Project Objectives

Our project aims to develop a robust system for categorizing and ranking low-frequency products in e-commerce using advanced AI techniques. To enhance categorization accuracy, we fine-tune a GPT model with contrastive learning and meta-learning. After categorization, we implement a ranking system combining XGBoost and a custom ColBERT model to recommend relevant products. This approach leverages textual and categorical features, addressing challenges like sparse data and improving the recommendation system's efficiency and effectiveness.

1.1 Specific Goals

- *Product Categorization Model: This model efficiently categorizes products as high-frequency or low-frequency. Its output is fed to a recommendation model.*
- *A Recommendation Model: A machine/Deep learning model that can effectively recommend products based on their history to users.*

Components of Our Solution:
- **Model:** A fine-tuned Generative Pre-trained Transformer (GPT) model enhanced with contrastive learning and meta-learning techniques for accurate categorization of low-frequency e-commerce products.
- **Feature Engineering Pipeline:** A comprehensive preprocessing pipeline including text normalization, tokenization, embedding generation, and cosine similarity-based grouping to identify product categories.
- **Ranking System:** A two-step ranking approach using XGBoost for shallow ranking and a custom ColBERT model for deep contextual ranking, ensuring relevant recommendations.
- **Efficient Backend Infrastructure:** Scalable infrastructure designed to handle large-scale data processing and facilitate training and inference of transformer-based and boosting models effectively.
- **Interactive Visualization and Analytics:** Tools to visualize data distributions, category groupings, and recommendation performance metrics, aiding in fine-tuning and decision-making.
- **Evaluation Framework:** Metrics like MRR@100 to measure ranking effectiveness and runtime benchmarks to ensure system efficiency, tested rigorously against baseline models.

2. Roles and Responsibilities

2.1 Member Roles

Complete the member roles table

Member Name	Strengths	Technical Responsibilities
Sylvester Ampomah	Research, ML concepts	Training and evaluating models
Sai Sowmya Bandaluppi	Research, ML concepts	Researching and writing technical reports

2.2 Logistics

Adjust this to assign team members tasks or define a rotation policy.
- Sylvester: responsible for creating weekly status update tickets and moving them to done as the sprint progresses
- Sowmya : responsible for taking notes during instructor meeting and posting them to slack

3. Communication Guidelines

3.1 Communication Tools

- We will use whatsapp for async communication between team members, mentors, and instructors
- We will use Zoom, Google Meet for meetings among team members.

3.2 Meetings

- The Team meets at least once in a week, date and time varies.
- In meetings, we discuss feedback from colleagues and the professor, how to improve our work.

3.3 Documentation & Reporting

- Meeting notes will be documented and shared over WhatsApp
- Team members will post weekly status updates to github projects no later than Wednesday night outlining:
    - what they worked on over the past week
    - if they are blocked on anything
    - what they are currently working on
- All members will be given equal opportunity to participate in discussion and be open to listening to diverse perspectives on all topics/ideas.
- All members must be transparent about their progress, challenges, and any delays they anticipate.

4. Decision-Making Process

You can discuss and modify these processes as your team sees fit.

- **Consensus-Based Decisions**: Major decisions will be made through consensus among all team members. In case of a deadlock, a majority vote will have the final say. If no majority is reached, the team will reach out to their mentor and instructor for guidance.
- **Documentation**: All decisions must be documented and shared with the team to ensure clarity and alignment.
- **Conflict Resolution**: Any conflicts between team members should first be addressed internally through open communication. If unresolved, members must notify the instructor who will then mediate.

5. Performance Standards

5.1 Work Distribution

- **Flexibility**: If a member is unable to complete a task, they must notify the team as soon as possible to allow for reallocation or assistance.

5.2 Respect and Professionalism

- **Mutual Respect**: All members are expected to treat each other with respect and professionalism.
- **Constructive Feedback**: Feedback should be given and received constructively, focusing on improving the project.

6. Resource Allocation

- **Time Commitment**: All members are expected to spend ~10 hours of time outside of class per week on the project.
- **Workload Distribution**: Tasks will be assigned based on each member's expertise and availability. Each member is expected to complete their assigned tasks within the agreed-upon deadlines.
- **Shared Resources:** *List any shared resources (compute, hardware, etc) and how to access them*

7. Signatures

By signing below, each team member agrees to uphold this team charter (add names as separate commits):
- Sylvester Ampomah , 17/11/2024
- Sai Sowmya Bandaluppi, 11/17/2024

8. Charter Review and Updates

This charter was last updated on 2024-11-17.
It was previously modified on:
- [YYYY-MM-DD]
- [YYYY-MM-DD]