Music Genre Classification Rubric

Overview

The assignment requires you to implement natural language processing (NLP) and machine learning (ML) methods for music genre classification through song lyrics analysis. Your main objective is to assess the capability of lyrics to differentiate between music genres.

Deliverables

The final submission needs to contain the following elements:

1. **Cleaned and Preprocessed Dataset**

   o The preprocessing operations (e.g., punctuation removal and stop words elimination) should be documented in detail.

   o The cleaned dataset should be delivered as a CSV file.

2. **Model Implementation**

   o The implementation should include at least two ML models:

       ▪ The traditional ML model uses Logistic Regression with TF-IDF as its example.

       ▪ The advanced NLP approach uses BERT embeddings as its example.

   o The Python notebooks or scripts for model training and evaluation should be provided with clear comments.

3. **Evaluation and Visualization**

   o Each model requires accuracy and precision and recall and F1-score evaluation results.

   o The report should include confusion matrices together with at least one visualization such as a PCA plot.

4. **Final Report** (2 pages max)

   o The report should provide a concise overview of your approach together with your results and main observations.

   o The paper evaluates both advantages and constraints of your research methodology.

o   The paper presents recommendations for future development alongside
    potential next steps.

Assessment Criteria

Criterion	Excellent (90-100%)	Good (80-89%)	Satisfactory (70-79%)	Needs Improvement (<70%)
Data Preparation	Data thoroughly cleaned; steps clearly documented and reproducible.	Data cleaned adequately; most steps documented.	Basic cleaning with minimal documentation.	Data preparation incomplete or poorly documented.
Model Implementation	Both models implemented clearly and correctly; code is well-commented.	Models implemented with minor errors or incomplete comments.	Models implemented but require significant clarification.	Poorly implemented models; significant errors present.
Evaluation & Visualization	Thorough evaluation using multiple metrics and clear visualizations.	Good evaluation with minor gaps in metrics or visualizations.	Adequate evaluation; visualizations could be clearer.	Evaluation unclear, incomplete, or missing visualizations.
Final Report	Concise, insightful, clearly outlines results and implications.	Clear and informative with minor issues in clarity or insight.	Basic reporting; covers main points but lacks depth.	Report incomplete, unclear, or lacks relevant insights.

Resources

[1] Tzanetakis, G., & Cook, P. (2002). Musical Genre Classification of Audio Signals. IEEE Transactions on Speech and

Audio Processing, 10(5), 293-302. https://ieeexplore.ieee.org/document/1021073

[2] Pizarro Martinez, S., Zimmermann, M., Offermann, M. S., & Reither, F. (2024). "Exploring Genre and Success

Classification through Song Lyrics using DistilBERT: A Fun NLP Venture." arXiv preprint arXiv:2407.21068.

https://arxiv.org/html/2407.21068v1

[3] GeeksforGeeks. (n.d.). "Text Preprocessing for NLP Tasks."

https://www.geeksforgeeks.org/text-preprocessing-for-nlp-tasks/

[4] Analytics Vidhya. (2021). "Text Preprocessing in NLP with Python Codes."

https://www.analyticsvidhya.com/blog/2021/06/text-preprocessing-in-nlp-with-python-codes/

[5] Analytics Vidhya. (2021). "Metrics to Evaluate Your Classification Model to Take the Right Decisions."

https://www.analyticsvidhya.com/blog/2021/07/metrics-to-evaluate-your-classification-model-to-take-the-right-decisions/

[6] Mendeley Data. (2020). "Music Lyrics Dataset (1950-2019) for Genre Classification." [Dataset].