**MUSIC GENRE CLASSIFICATION**

**Overview:**

Welcome to the Music Genre Classification project! This project aims to classify audio files into different music genres using machine learning techniques. By analyzing audio features and training various classifiers like [Decision tree classifier](https://www.geeksforgeeks.org/decision-tree/),[Ada Boost classifier](https://www.geeksforgeeks.org/implementing-the-adaboost-algorithm-from-scratch/),[knn classifier](https://www.geeksforgeeks.org/k-nearest-neighbours/),[logistic regression classifier](https://www.geeksforgeeks.org/understanding-logistic-regression/),[Naive Bayes classifier](https://www.geeksforgeeks.org/naive-bayes-classifiers/) the project provides a robust solution for automated genre classification.

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**Installation**

To install Music Genre Classification, follow these steps:

1. Clone the repository: git clone [(https://github.com/THANU3SREE/MusicgenreclassifcationPRML.git)](https://github.com/THANU3SREE/Music-genre-classifcation-PRML.git)

2. Navigate to the project directory: cd Music Genre Classfication

3. Install dependencies: pip install r requirements.txt

**Usage**

To use Music Genre Classification with the GTZAN dataset:

1. Overview:

Music Genre Classification categorizes music into genres based on audio features using the GTZAN dataset.

Steps:

1. Load the GTZAN dataset.

2. Extract audio features.

3. Preprocess the feature data.

4. Split the dataset into training and testing sets.

5. Train classification models.

6. Evaluate model performance.

2. Code Snippets and Examples:

Sample code:

* Load the GTZAN dataset.
* Extract audio features.
* Train a decision tree classifier.

3. Configuration Options:

Modify:

* Feature extraction parameters.
* Model hyperparameters.

This version specifies that the GTZAN dataset is used for music genre classification and provides a brief overview of the process.

## **Configuration**

In the Music Genre Classification project, users can modify certain configuration options to customize their experience. Below are the key configuration options and how to modify them:

1. Feature Extraction Parameters:
   * Users can adjust parameters for feature extraction to finetune the model's performance.
   * Example: Change window size and hop length for melspectrogram feature extraction.
2. Model Hyperparameters:
   * Hyperparameters such as tree depth, learning rate, and number of estimators can be adjusted to optimize model performance.
   * Example: Modify the maximum depth and minimum samples split for decision tree classifiers.

**Contributing**

We welcome contributions from the community! To contribute to Music Genre Classification, follow these steps:

1. Fork the repository.

2. Create a new branch: git checkout b featurename

3. Make your changes and commit them: git commit am 'Add new feature'

4. Push to the branch: git push origin featurename

5. Submit a pull request.

For more information, please read our [[Contributing Guidelines](https://github.com/THANU3SREE/Music-genre-classifcation-PRML/blob/main/Contributing.md.pdf)]

**FAQs:**

1. What does this project do?

This project automatically classifies music into different genres using machine learning.

2. Which dataset is used?

The project uses the Gtzan dataset, containing various music genres like rock, jazz, pop, and classical.

3. How does it classify music?

By analyzing features like tempo, spectral characteristics, and melfrequency cepstral coefficients (MFCCs) extracted from audio files.

4. Which machine learning algorithms are used?

Logistic regression, knearest neighbors (KNN), decision trees, adaboost, and naive Bayes are implemented.

5. How accurate are the classifications?

Accuracy varies but is assessed through testing on unseen data and crossvalidation.

6. Can I use my own music files?

Yes, you can, provided they're compatible and follow the project's preprocessing steps.

7. How can I contribute?

Contributions are welcome! You can add features, improve code, fix bugs, or provide documentation. Check the Contributing Guidelines for details.

8. Are there any requirements to run the project?

Yes, dependencies like pandas, scikitlearn, librosa, matplotlib, and seaborn must be installed.

9. Where can I get help if I have issues?

Open an issue on GitHub or seek assistance from project maintainers or community forums.

10. Is this project suitable for realtime music classification?

Additional optimizations may be needed for realtime classification, but the project serves as a foundation.

**References:**

* <https://www.kaggle.com/code/dudayang/work-w-audio-data-visualise-classify-re-f6ad43#Results-Comparison>
* <https://www.kaggle.com/datasets/andradaolteanu/gtzan-dataset-music-genre-classification/code>

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