PROBLEM STATEMENT:

The goal of this project is to develop a machine learning model capable of automatically classifying music tracks into predefined genres based on their audio features. With the rapid growth of digital music libraries, efficient and accurate genre classification has become essential for better organization, personalized recommendations, and musicological analysis. This project will utilize the GTZAN dataset, which contains 1,000 audio tracks spanning ten genres: blues, classical, country, disco, hip-hop, jazz, metal, pop, reggae, and rock.

To achieve this, key audio features such as Mel Frequency Cepstral Coefficients (MFCCs) will be extracted to capture the timbral and spectral characteristics of the tracks. The K-Nearest Neighbors (KNN) algorithm will be implemented for classification due to its simplicity and proven effectiveness in similar audio classification tasks. The model's performance will be evaluated using metrics like accuracy, precision, recall, and F1-score to ensure robustness and generalizability.

By automating the genre classification process, this project aims to contribute to the fields of music information retrieval and recommendation systems, making it easier to manage large-scale music databases and enhance user experiences on music platforms.