Title: MoodMate: Emotion Detection and Music Recommendation System

Objective: To develop an intelligent system that detects a user's emotional state from facial expressions or text input and recommends music that aligns with or enhances the user's mood using AI/ML techniques.

Outcomes:

- Understand the integration of computer vision or NLP with recommendation systems.
- Gain experience with emotion detection from images or text.
- Build a recommendation engine using music metadata and emotion mapping.
- Deliver an interactive prototype with real-time emotion-based music suggestions.

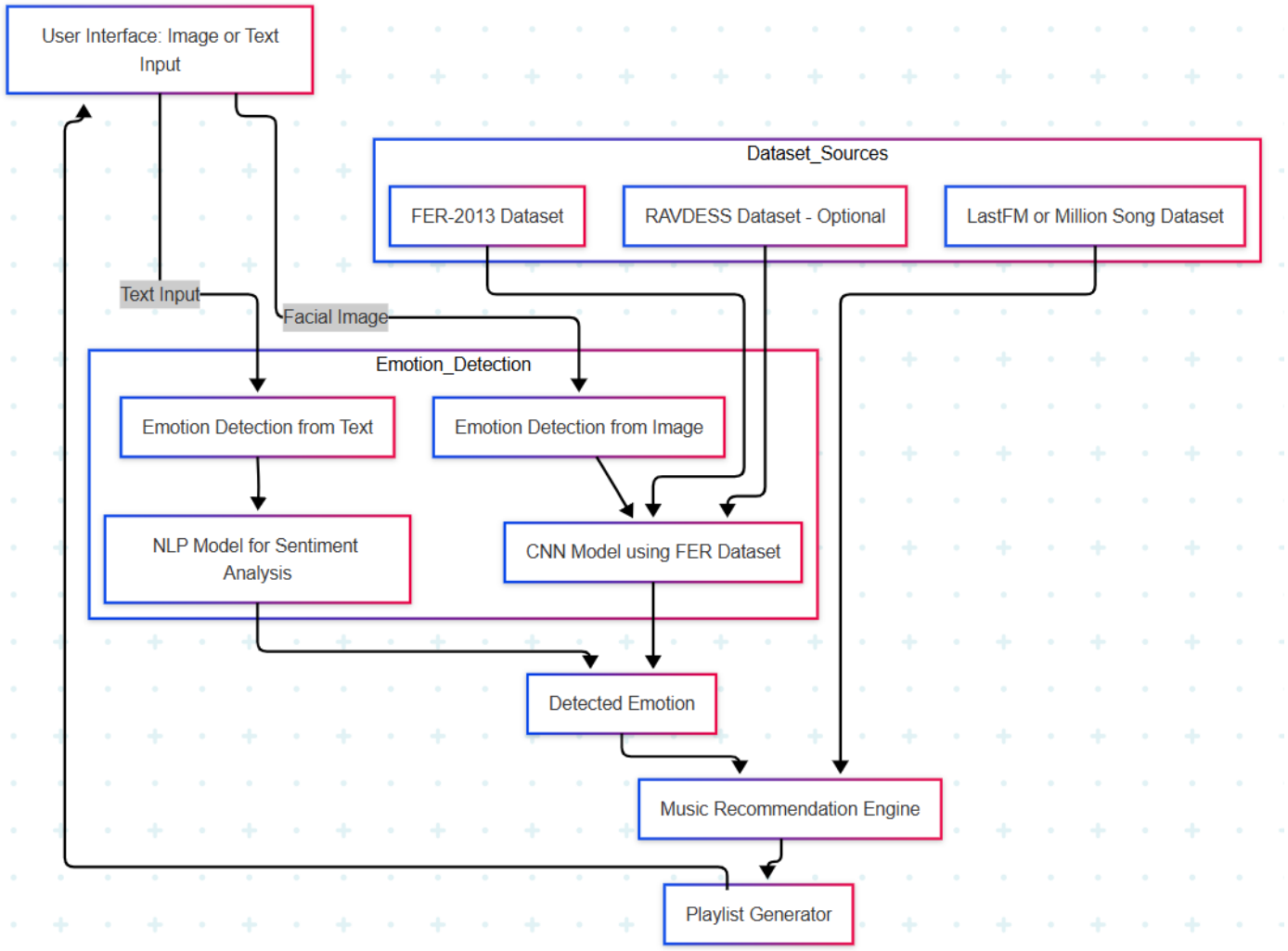
Dataset:

- **FER-2013 Dataset** (for emotion detection from facial images): Open-source dataset available via Kaggle.
- **Million Song Dataset (subset)** or **Last.fm dataset** (for music recommendation based on tags, genre, mood): Freely available.
- **RAVDESS (Ryerson Audio-Visual Database of Emotional Speech and Song)** – optional for multimodal emotion analysis.

Modules to be Implemented:

1. Data Collection & Preprocessing
2. Emotion Detection Module (Image or Text-based)
3. Music Dataset Processing and Feature Extraction
4. Emotion-to-Music Mapping and Recommendation System
5. UI for Real-Time Interaction
6. Evaluation and Final Integration

Architectural Diagram:



Week-wise Module Implementation:

Milestone 1: Week 1 & 2 - Requirements & Dataset Preparation

- Define project scope and tech stack.
- Download and explore FER-2013 and music datasets.
- Clean and preprocess emotion image/text data.
- Extract and organize music features (genre, mood, etc.).

Milestone 2: Week 3 & 4 - Emotion Detection System

- Build and train a CNN-based model for facial emotion recognition or BERT/LSTM for sentiment analysis from text.
- Test and evaluate the model on validation data.
- Save emotion classification outputs for recommendation use.

Milestone 3: Week 5 & 6 - Music Recommendation Engine

- Map detected emotions to relevant music tags (happy, calm, sad, etc.).
- Build a content-based filtering model using cosine similarity or TF-IDF on tags.
- Integrate both modules.
- Return music suggestions based on real-time emotion input.

Milestone 4: Week 7 & 8 - UI, Testing & Final Presentation

- Develop front-end for image upload/text input and playlist suggestion.
- Perform real-time testing and validation.
- Final documentation and deployment.
- Prepare a demo video and presentation.

Evaluation Criteria:

- **Milestone 1:**
  - Successful acquisition and preprocessing of datasets
  - Clear emotion-music label mapping
- **Milestone 2:**
  - Model accuracy for emotion classification
  - Ability to generalize to test data
- **Milestone 3:**
  - Precision of music recommendations based on emotion
  - Integration quality and smooth emotion-music flow
- **Milestone 4:**
  - Functional UI and end-to-end demo
  - Quality of presentation and documentation