Music Genre Classification

1. Problem Formulation
   - Clarifying questions
     - What is the genre of the given music?
     - Should the model Recommend some music based on it?
     - How will the user input the music? (file or link or name?)

   - Use case(s) and business goal
     - Help one's identity the genre of the songs

   - Requirements
     - It should give genre of the music in 10-15 seconds
       - If not do something
   - Constraints
     - List of 10 genre
     - Only 1 genre of 1 song

   - Data: sources and availability
     - GTZAN, others?
   - Assumptions
     - Their is a genre of that music
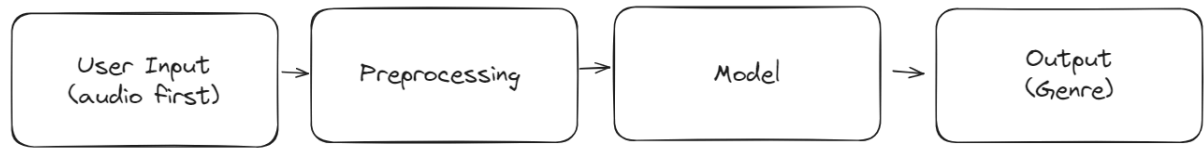   - ML formulation
     - Classification
2. Metrics
   - Offline metrics
     - Acc
   - Online metrics

3. Architectural Components
   - High level architecture

```
┌──────────────┐     ┌──────────────┐     ┌──────────────┐     ┌──────────────┐
│  User Input  │ ──> │Preprocessing │ ──> │    Model     │ ──> │   Output     │
│ (audio first)│     │              │     │              │     │   (Genre)    │
└──────────────┘     └──────────────┘     └──────────────┘     └──────────────┘
```

4. Data Collection and Preparation
   - Data needs
   - Data Sources

        GTZAN

   - Data storage

        Local

   - ML Data types
   - Labeling
5. Feature Engineering
   - Feature selection

        Grid Searching

   - Feature representation
   - Feature preprocessing
6. Model Development and Offline Evaluation
   - Model selection
   - Dataset construction
   - Model Training
   - Model eval and HP tuning
   - Iterations
7. Prediction Service
8. Online Evaluation and Deployment