# 🎧 AI Audio Mixing Software – Workflow

## 1. Start: User Uploads Audio Stems

The user uploads multiple audio tracks (stems) such as vocals, drums, bass, etc., into the software.

## 2. AI Analyzes Stems

The AI automatically processes each stem using the following analysis criteria:

* • Genre Classification – Identifies the song's genre (pop, hip-hop, rock, EDM, etc.).
* • Instrument Detection / Source Separation – Detects instrument types in each stem.
* • Loudness Analysis – Measures RMS, LUFS, peak levels.
* • Spectral Features – Analyzes brightness, boominess, noisiness, and tonal characteristics.
* • Dynamic Range Detection – Evaluates compression needs using crest factor.
* • Sibilance Detection – Detects harshness in the 5kHz–10kHz range.
* • Masking Detection – Identifies frequency overlaps between instruments.
* • Stereo Width Analysis – Checks phase, left/right balance, and stereo content.
* • Tempo & Beat Detection – Extracts BPM and beat grid.
* • Key Detection – Determines musical scale/key.
* • Formant & Timbre – Evaluates tone quality (e.g., warmth or airiness).
* • Clipping/Distortion Detection – Flags waveform clipping or digital saturation.
* • Emotion Detection (optional) – Detects the mood of the music.
* • Presence / Air Estimation – Assesses brightness and clarity.
* • Silence & Noise Floor – Detects background noise and gaps.
* • Transient Energy Analysis – Measures punchiness or sharpness.
* • Reverb / Room Tone Estimation – Identifies room acoustics in recordings.
* • Track Structure Detection – Segments the song into intro, verse, chorus, etc.

## 3. Display Detected Issues + Metadata

The software shows issues found in the mix:

• Example: “Too much low-end in guitar track”

• Displays detected Genre, Key, and BPM

## 4. User Confirms

The user confirms:  
• Which issues to fix  
• The detected genre, BPM, and key

## 5. AI Performs Mixing

The AI:  
• Applies EQ, compression, stereo adjustments, transient shaping, etc.  
• Balances and mixes tracks based on confirmed inputs

## 6. User Previews Mixed Track

A preview player allows the user to listen to the mix before finalizing.

## 7. User Fine-Tunes via Prompt

The user can enter natural language commands like:  
• “Make vocals brighter”  
• “Reduce reverb on snare”  
AI applies the prompt and re-renders the mix

## 8. Final Export

Once satisfied, the user downloads:  
• Final mixed track(s)  
• Optionally: Individual mixed stems

## 9. End

The process is complete.