Hackathon Project Phases Template that ensures students can complete it efficiently while covering all six phases. The template is structured to capture essential information without being time-consuming.

Hackathon Project Phases Template

Project Title:

Audio2Img

Team Name:

AIML-BOTS

Team Members:

- Y. Kusumaharish
- Sk. Md. Firoz
- C. Mohan Venkata Aditya
- I. Ramu

Phase-1: Brainstorming & Ideation

Objective:

- Identify the problem statement.
- Define the purpose and impact of the project.

Key Points:

- **Problem Statement:** Many artists struggle to find inspiration for their work, and non-artists lack tools to create artistic visuals easily. Converting audio into artwork can bridge creativity across different media forms.
- **Proposed Solution**: Audio2Art is an AI-driven tool that generates unique artwork based on the features of an input audio file, including mood, rhythm, and intensity.

- **Target Users:** Digital artists, musicians, content creators, and anyone interested in generative AI-based art.
- **Expected Outcome:** A system that transforms sound into visually appealing art, expanding creative possibilities.

Phase-2: Requirement Analysis

Objective:

- Define technical and functional requirements.

Key Points:

- Technical Requirements: Python, TensorFlow/PyTorch, OpenCV, Deep Learning Models (GANs, Style Transfer), Audio Processing Libraries (Librosa, FFmpeg), Cloud/Local Hosting.
- **Functional Requirements**:
  - Accepts audio files as input.
  - Analyzes beats, frequencies, and mood.
  - Generates artistic visuals based on extracted features.
  - Provides customizable artistic styles.
  - Allows saving and sharing generated artwork.
- **Constraints & Challenges:**
  - Processing high-quality audio in real time.
  - Ensuring diverse and unique artwork generation.
  - Optimizing performance for different computing capabilities.

Phase-3: Project Design

Objective:

- Create the architecture and user flow.

Key Points:

- System Architecture Diagram: (Include a flowchart showing how audio input is processed and transformed into artwork.)
- **User Flow:**
    - User uploads/selects an audio file.
    - System processes the audio to extract features.
    - AI model generates corresponding artwork.
    - User can customize and save the output.
- **UI/UX Considerations:**
    - Simple and intuitive interface.
    - Real-time preview of generated artwork.
    - Easy-to-use customization options.

Phase-4: Project Planning (Agile Methodologies)

Objective:

- Break down the tasks using Agile methodologies.

Key Points:

- **Sprint Planning**: Define key milestones (Audio Analysis, Model Training, UI Development, Integration, Testing, Deployment).

- **Task Allocation**: Assign tasks based on team expertise (Backend, AI Model, Frontend, Testing, Deployment).
- **Timeline & Milestones**: Estimated timeline for completion with iterative development cycles.

Phase-5: Project Development

Objective:

- Code the project and integrate components.

Key Points:

- Technology Stack Used: Python, TensorFlow/PyTorch, OpenCV, Librosa, Flask/Django, React.
- **Development Process:**
  - Develop audio feature extraction module.
  - Train AI models for image generation.
  - Build frontend and backend for user interaction.
  - Optimize performance and scalability.
- **Challenges & Fixes**:
  - Fine-tuning AI models for better output.
  - Reducing processing time without quality loss.
  - Handling diverse audio input types.

Phase-6: Functional & Performance Testing

Objective:

- Ensure the project works as expected.

Key Points:

- **Test Cases Executed:**
  - Different audio inputs (music, speech, ambient sounds).
  - Varying durations and qualities.
  - Stress testing for large files.
- **Bug Fixes & Improvements:**
  - Reduce latency in image generation.
- **Final Validation:**
  - Ensure generated art aligns with audio features.
- **Deployment (if applicable):**
  - Hosted on cloud/local server.
  - Accessible via web or app.

Final Submission

- **Project Report based on the template.**
- **GitHub/Code Repository Link.**
- **Presentation.**
