

Contributions

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Role: Metronome Development, Dashboard Integration, System Testing

Tasks:

- **Metronome Functionality:**
Developed the core functionality of the metronome using a Raspberry Pi, including GPIO management and the logic for controlling the LED light based on the BPM (beats per minute).
Implemented a button interface for the user to input taps and switch between learning and play modes. This involved using the Raspberry Pi's GPIO pins to register button presses and control LEDs.
Implemented the logic for calculating BPM from user taps, allowing the metronome to adjust the light pulse rate based on the calculated BPM.
- **Flask API Integration:**
Developed a Flask API to manage and update the BPM in real-time via HTTP requests. This allows users to interact with the metronome remotely, updating settings or querying the current BPM.
Integrated data persistence by saving the BPM, minimum, and maximum BPM values to a JSON file, ensuring the data persists between sessions.
- **Dashboard Development:**
Created the web-based dashboard for visual control and monitoring of the metronome's BPM. This includes an HTML interface that allows users to view and update the BPM in real-time through a user-friendly interface.
Integrated the frontend with the Flask API, enabling the frontend to send and receive data to and from the Raspberry Pi, ensuring smooth synchronization between the physical metronome and the web dashboard.
- **Testing and Debugging:**
Conducted extensive testing to ensure the metronome's functionality worked as expected, both in the local environment and through the web interface.
Debugged issues related to GPIO timing and button presses to ensure that the metronome reacted in real-time without lag or errors.
- **Documentation:**
Wrote the README.md file to explain the setup, usage, and functionality of the metronome project. Provided detailed instructions for users to set up the hardware and software, ensuring the project is easy to understand and deploy.
Documented the code for maintainability and to ensure that other team members or future developers can easily understand and contribute to the project.