MIDI Sequencer

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1 Objective and requirements

Our goal is to turn the UNO32 Chipkit into a MIDI sequencer where we can use a MIDI keyboard to create sequences of MIDI data. We intend to output from the chipkit in MIDI form so that an external device can parse the output into sound. A sequencer is a electronic device for storing sequences of musical notes and rhythms. We want to qualify as an advanced project.

The main requirements of our project are:

- Record sequences from MIDI input
- Output the stored sequence via MIDI
- Clear the stored sequence
- Undo last edit
- Play/pause
- Toggle record enable/disable

If there is time for it we will implement the following:

- Remove specific note in sequence
- Adjustable BPM (tempo)
- Use LCDs to display information about the saved sequence
- Transpose function
- Multiple sequences stored
- Mutable quantization

2 Solution

We will use the ChipKIT Uno 32 board along with the Basic I/O shield to develop our sequencer. The buttons and switches on the I/O shield will be used to implement the features listed in our requirements. We will use a matrix (2D-array) to store input MIDI data on the ChipKIT, where the columns represent time intervals and each row represents one pitch. A timer will loop through the columns of the matrix and send the MIDI data stored in each column using UART to external devices.

3 Validation

We will connect our MIDI output to an external device and record a sequence. If the sequence is played back by the device then our sequencer is working properly.