final project - mus 171

- create one of the following synths in pd

a - polyphonic sampler with filter and waveshaping
b - polyphonic fm synth with filter and delay

- all the workings of the synth should be in subpatches, the main window should just be labelled controls with a logical layout.

- synth should have at least 6-voice polyphony

- the synth should be playable by MIDI with note and pitchbend

- all parameters should be controlled by MIDI controllers

- create 4 presets which can be loaded by button click

extra credit FM - make a button that randomizes all parameters

extra credit sampler - add crossfade looping

final project should be presented during the final period, patch should be handed in on cd-r.

the following diagrams represent a single voice of the sampler and fm synth. the knobs represent the parameters, and all parameters should be shared by all voices. for example, if you have 6 voices, you will have 6 filter sections. however, there will be only a single quality control which will go to all 6 filter sections.
One voice of FM synth

- **Ratio**: Modulator/carrier frequency ratio: 1 - 20
- **Index**: Modulation index: 0 - 20
- **Waveform**: Select modulator waveform: sine, square, triangle or noise
- **Index Mod**: Amount of envelope to apply to index: 0 - 20
- **Detune**: Difference of pitch from FM B to FM A: -1200 to 1200 cents
- **Wet/Dry**: Mix between delayed and original signal: all original to all delayed
- **Feedback**: 0 - 1
- **Delay Time**: 1 - 100 ms
- **Lfo Frequency**: Frequency of delay modulating oscillator: 0.1 to 20 Hz
- **Lfo Depth**: Amount of modulation applied to delay: 1 - 5 Hz

- **Frequency**: Cutoff frequency of filter: 50 - 15000
- **Quality**: 0.1 - 100
- **Frequency Mod**: Amount of envelope to apply to filter: 50 - 15000
Looping Sampler A
- loop start
- loop length
- waveform
- record

Looping Sampler B
- loop start
- loop length
- waveform
- detune
- record

Mixer
- attack
- decay
- sustain
- release
- level a
- level b

Chebychev Waveshaper
- level original
- level cheby 2nd
- level cheby 4th
- level cheby 7th

4 pole Low Pass Filter
- frequency
- quality
- freq mod

Filter Frequency Envelope
- attack
- decay
- sustain
- release

Voice out

One voice of sampler

loop start - in percentage of wavetable size: 0 - 100
loop length - in percentage of wavetable size: 0 - 100
detune - difference of pitch from Sample B to Sample A: -1200 to 1200 cents
wavetable - switch between 4 samples
record - record from adc into current wavetable

chebychev levels - all from 0 to 100 dB

frequency: cutoff frequency of filter: 50 - 15000
quality: 0.1 - 100
frequency mod - amount of envelope to apply to filter: 50 - 15000