IMCA 221
Programming for Artists
Winter 2026

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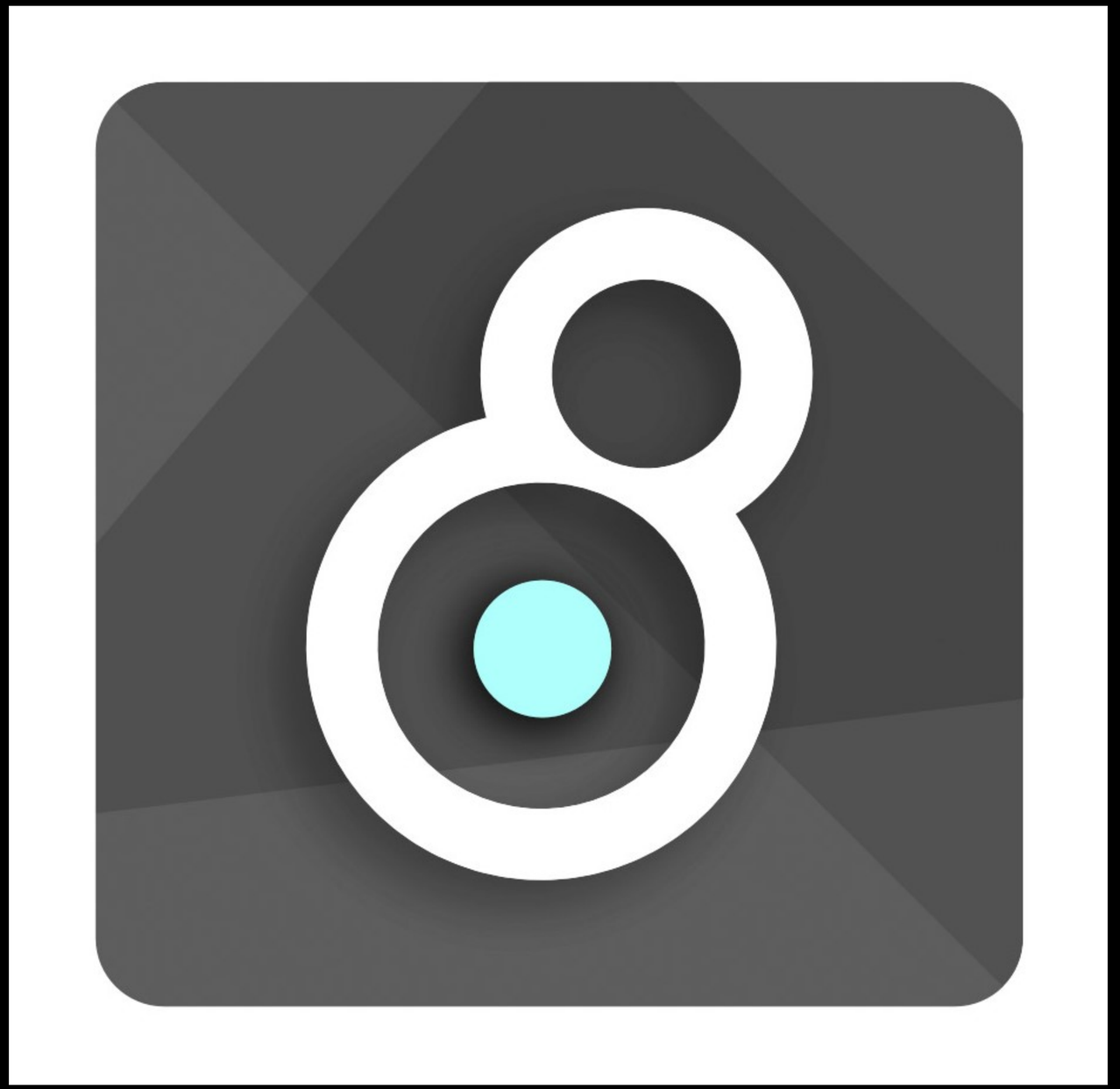
Class is on Zoom even in the classroom for sharing, find the details on Moodle https://moodle.concordia.ca/

Download the slides!

Inspo

Resources:

Max Documentation: https://docs.cycling74.com/max8
Max Cookbook https://music.arts.uci.edu/dobrian/maxcookbook/
Andrew Robinson Video Tutorials https://www.youtube.com/@AndrewRobinson26



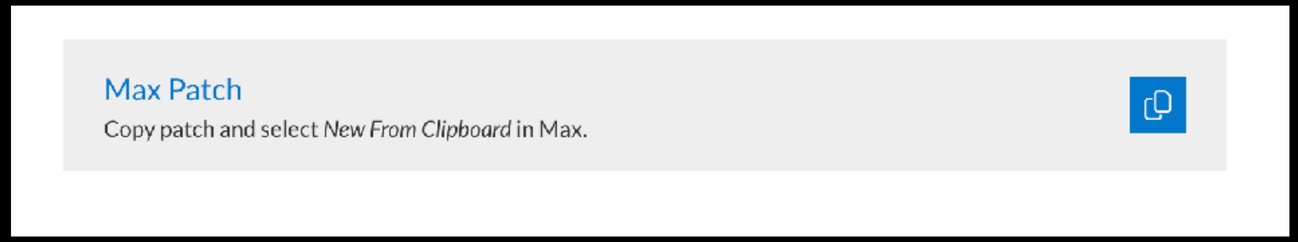
Keyboard Shortcuts

https://docs.cycling74.com/max8/vignettes/keycommands

a: attrui.
b: button.
c: comment.
f: floating point number box.
h: briefly highlights a small area around the cursor.
H: A capital letter "H" briefly highlights a larger area around the cursor.
i: integer number box.
j: object box containing "jit." for creating Jitter objects.
l: object box containing "live." for creating Live objects.
m: message.
n: new blank object with the cursor active. Typing the name of any object and pressing enter or clicking outside of the object box will transform it into that object.
r: bring up a list of the most recently created objects, including any arguments and attributes typed in. Selecting an element from the list creates an object with the corresponding text and with the cursor active at the far right. Hitting a carriage return or clicking away from the object instantiates the object.
p: create an object box containing the message newobj @presentation 1 @text and a cursor. When you type the name of an object (e.g. dial) and hit a carriage return, the object will transform itself into a copy of the object whose name you type in, and the object will be automatically added to the Presentation Layer.
s: slider.
t: toggle.
x: shows a menu describing the key commands, including those added by external packages.
z: zooms the patcher in around the cursor.
Z: A capital letter "Z" zooms the patcher out around the cursor.

You can copy Max code and paste it directly into your patch as text.

CMD + V (paste)




```
{
     "boxes" : [      {
               "box" :          {
                    "maxclass" : "gain~",
                    "patching_rect" :
[ 385.792366743087769,
357.923513054847717, 22.0, 140.0 ],
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                    "parameter_enable" : 0,
                    "numinlets" : 1,
```

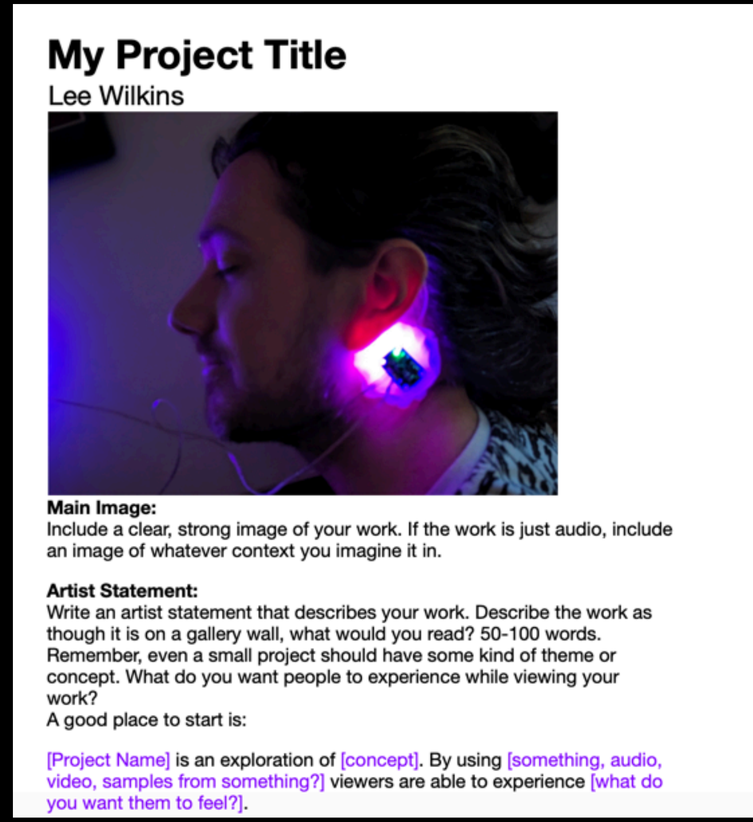
Audio Experiment today (midnight, after class)

- Explore audio tools we worked on in class
- Practice and explore tutorials online
- Create an experiment, which could be the beginning of a future project
- Your experiment should have a concept, even though it is not fully developed.

To hand in yoru project, use the project template on Moodle
saved file (File > Save as Project) .maxpat

- A PDF that contains project documentation. See Project_Documentation_template
- A clear, strong image of your project.
- A screen capture of your max patch
- A link to video or audio recording of your project working (can be a video or a link to a private video on YouTube, Vimeo or Google)
- A 50-100 word explanation of your project inside your maxpatch Be sure to name files properly (no untitled-1.zip) All files are expected to be cleaned up and arranged in a reasonable, legible way. Videos should be clear, well light and show your project working.

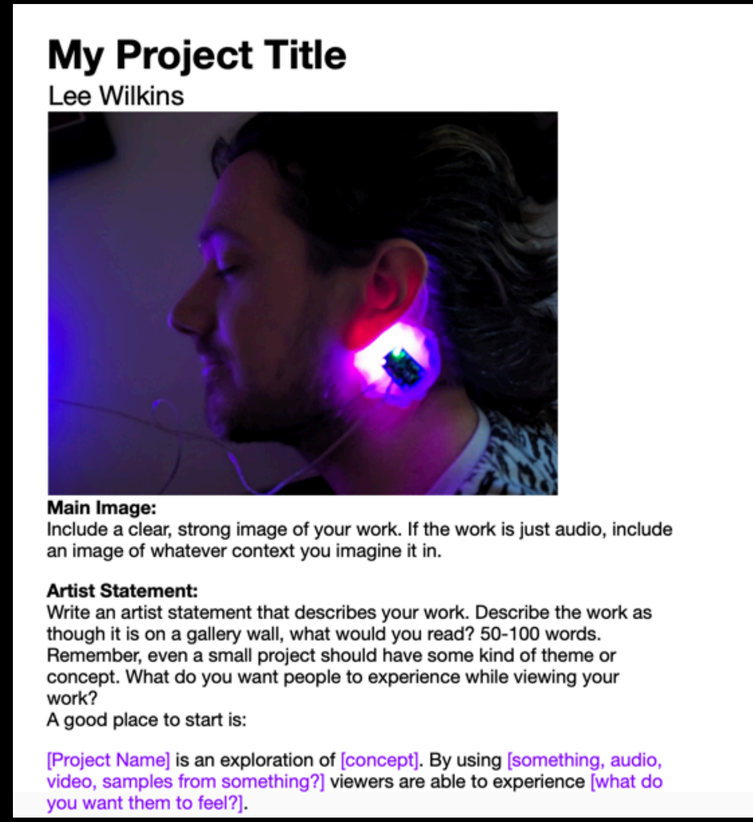
All files are expected to be cleaned up and arranged in a reasonable, legible way. Videos should be clear, well light and show your project working.



Project Template on Moodle has everything you need, just replace the text and images with your own.

Audio Experiment today (midnight, after class)

25% Functionality / technical
25% creativity / concept
25% execution and quality
25% documentation



My Project Title

Lee Wilkins

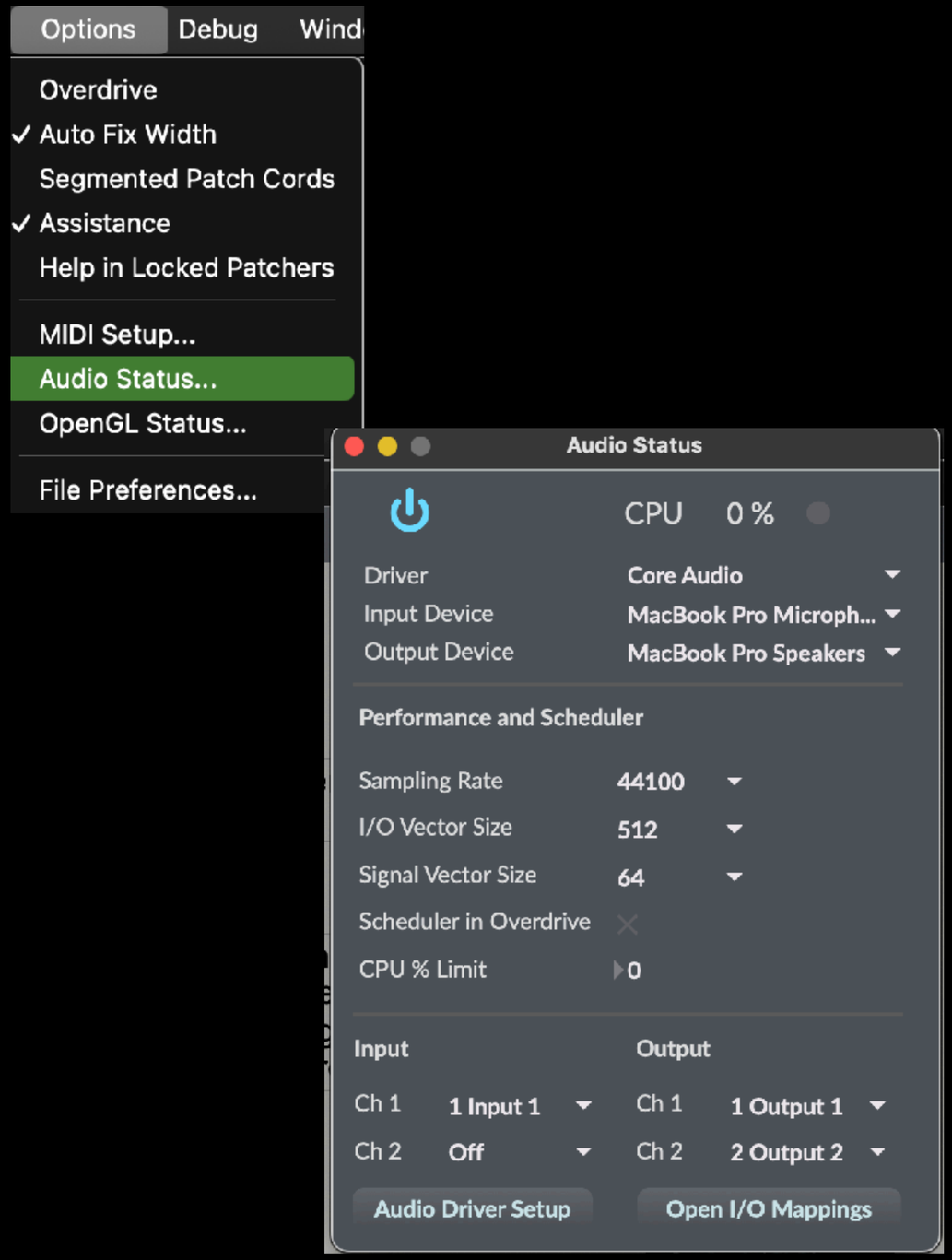
Main Image:
Include a clear, strong image of your work. If the work is just audio, include an image of whatever context you imagine it in.

Artist Statement:
Write an artist statement that describes your work. Describe the work as though it is on a gallery wall, what would you read? 50-100 words. Remember, even a small project should have some kind of theme or concept. What do you want people to experience while viewing your work?
A good place to start is:

[Project Name] is an exploration of [concept]. By using [something, audio, video, samples from something?] viewers are able to experience [what do you want them to feel?].

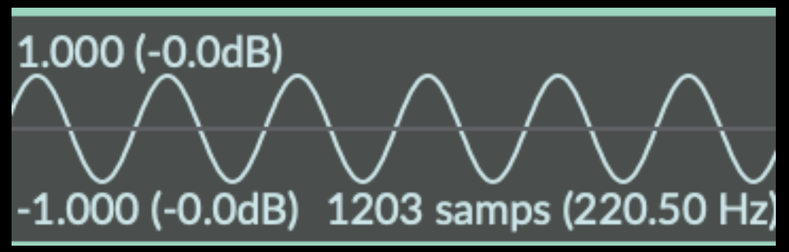
Project Template on Moodle has everything you need, just replace the text and images with your own.

Audio Status shows where sound is being output. Make sure the sources are correct. You may need to restart it (press the power button)



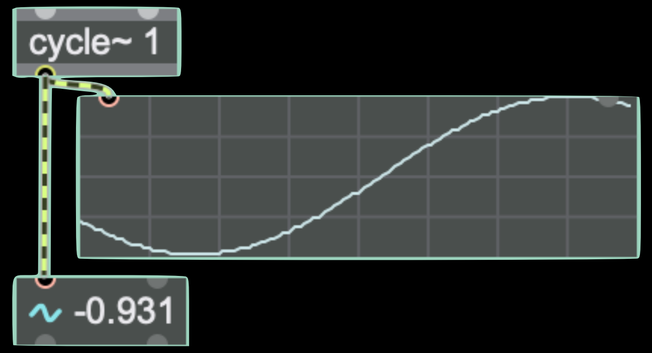
What is a signal?

A signal is a constant stream of numbers being sent through a patch cord. This is usually for audio purposes. We can view a signal on a scope~ object, which shows the numbers plotted across time.

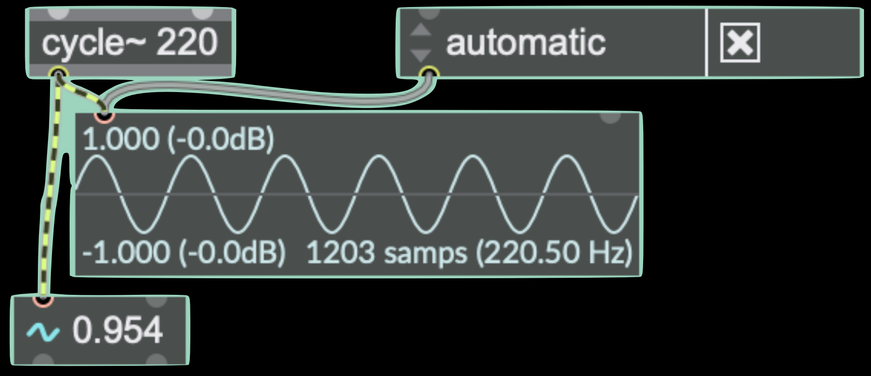


Cycle~

Cycle is a wave form. It constantly outputs data in the form of a wave, between -1 and 1

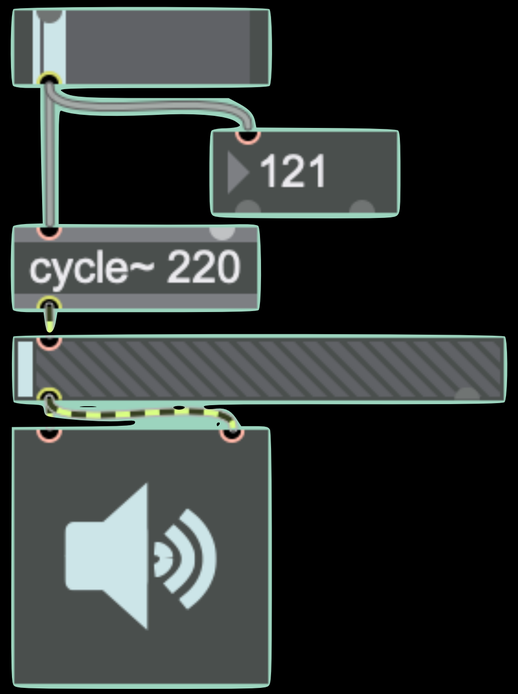


The parameter is the number of times this cycle happens per seconds. That's hz! So 220 times per second a cycle of -1 to 1 is completed.



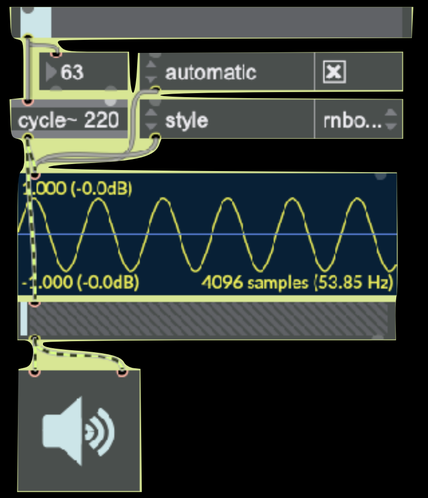
Cycle~ makes a sound, at 220 hz is A3.

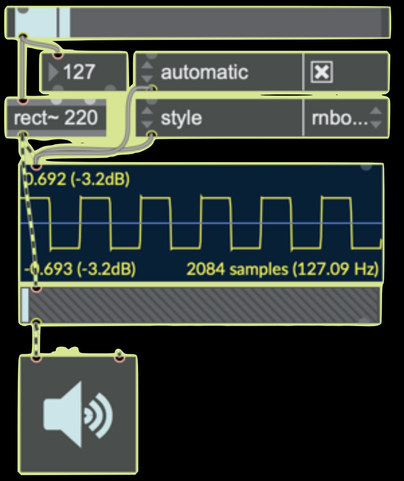
We can add a slider and adjust the value so it outputs 100-2000. Then we can change the note on the sine wave!



Cycle~ rect~ phasor~ tri~

There are lots of other waves that also make sounds!

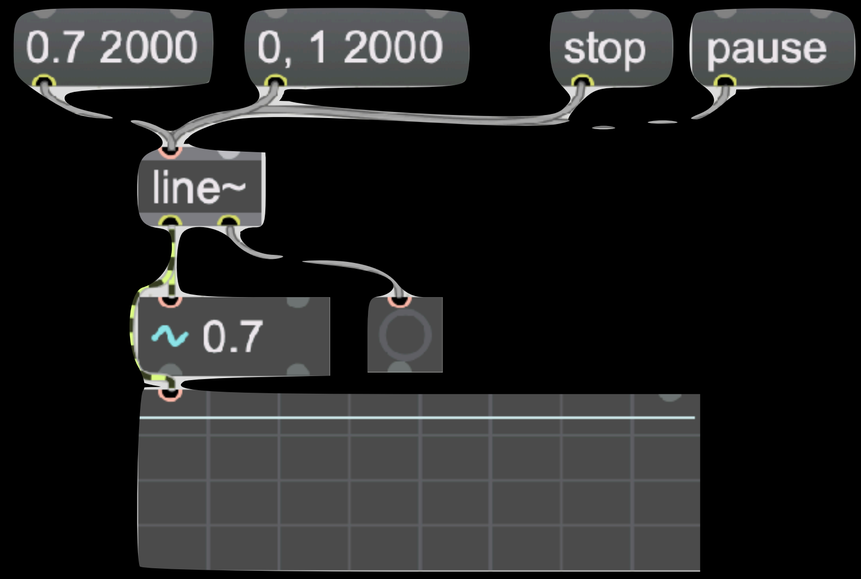




Lets try to modulate the wave.

Line~ will help us do this by making a steady stream of numbers between two points, which we can use to control the wave.

Line~ is for signals. Send it a message with:
start point, end point, time to reach each point.
Scope~ and flonum~ can help us view it.

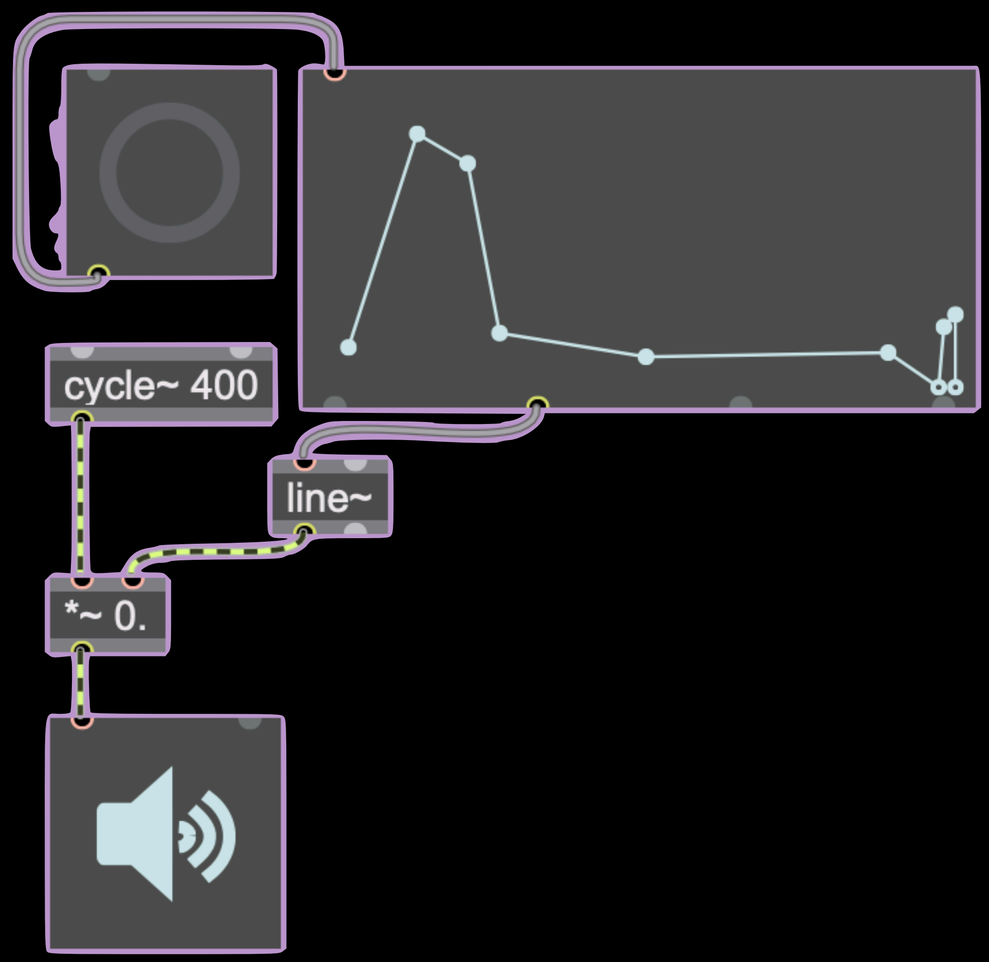


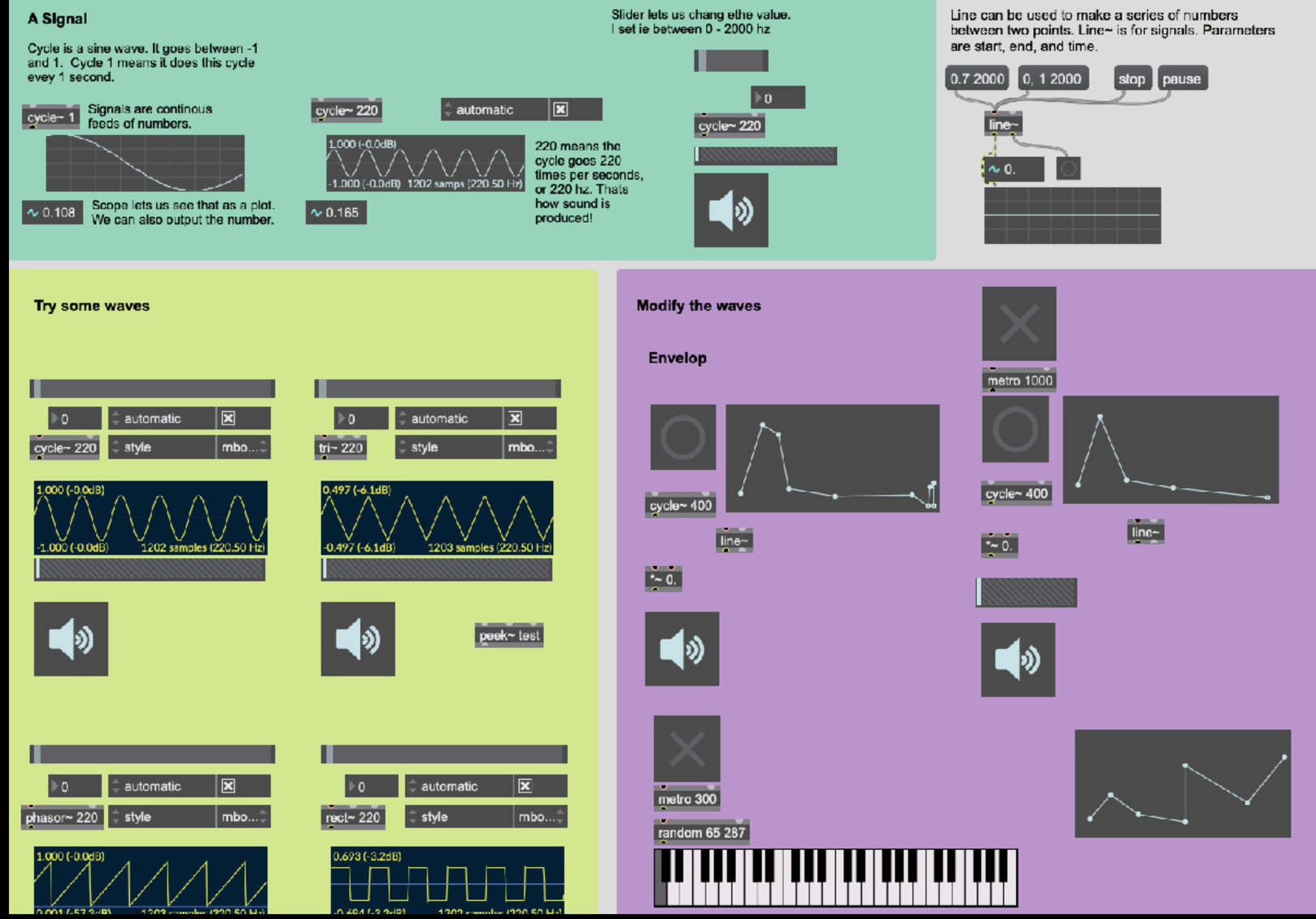
Use the function object to create a line rather than messages.

We can then multiply the signal by the line value to create an envelope.

If your envelope ends in 0s, you will get a finite sound, but if it doesn’t you will get a lingering tone.

Try it with a metro or tempo.



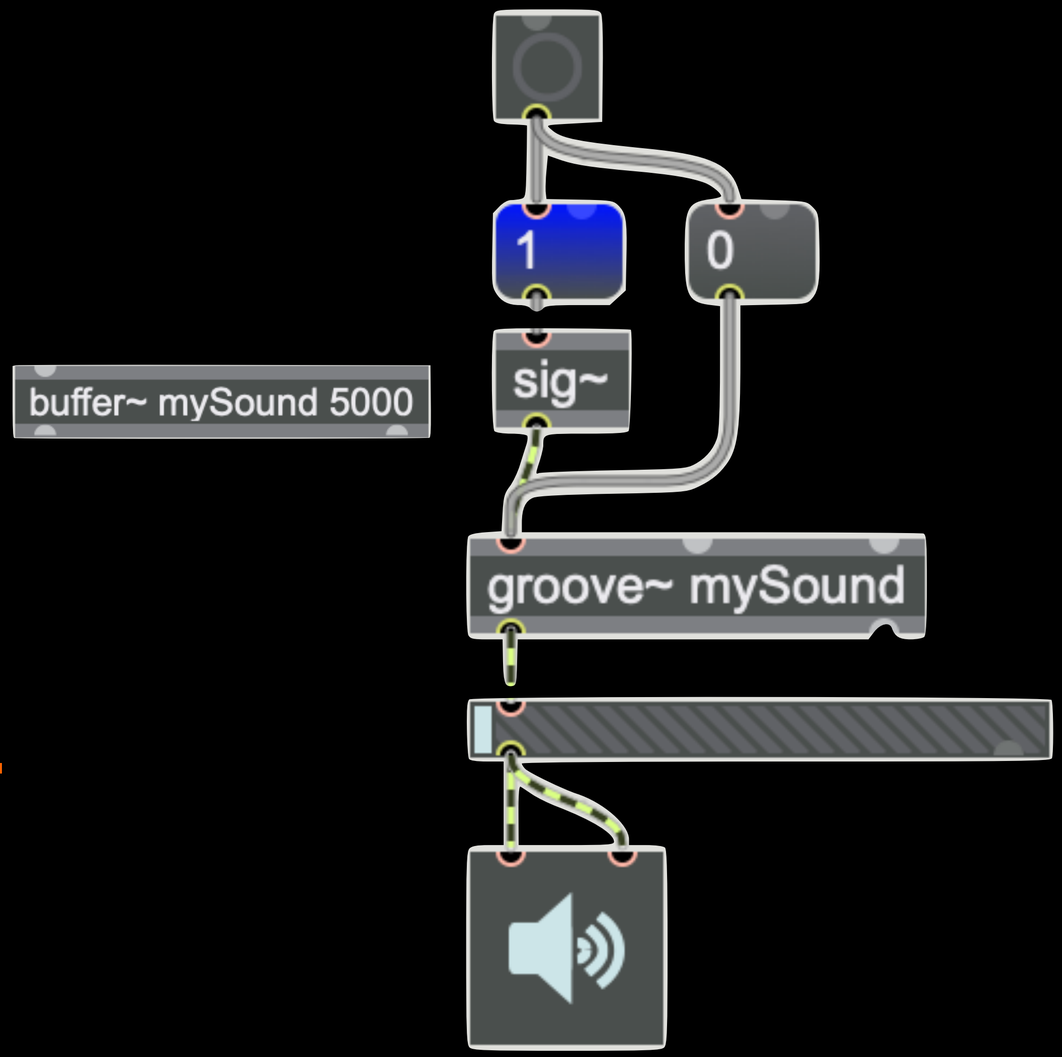


For more see Waveform_Envelope_line.maxpat

Now that we understand signals better, lets look at an advanced play object called groove~

Groove~ uses signals to determine how the file plays forward. It needs to know the signal rate and where to begin.

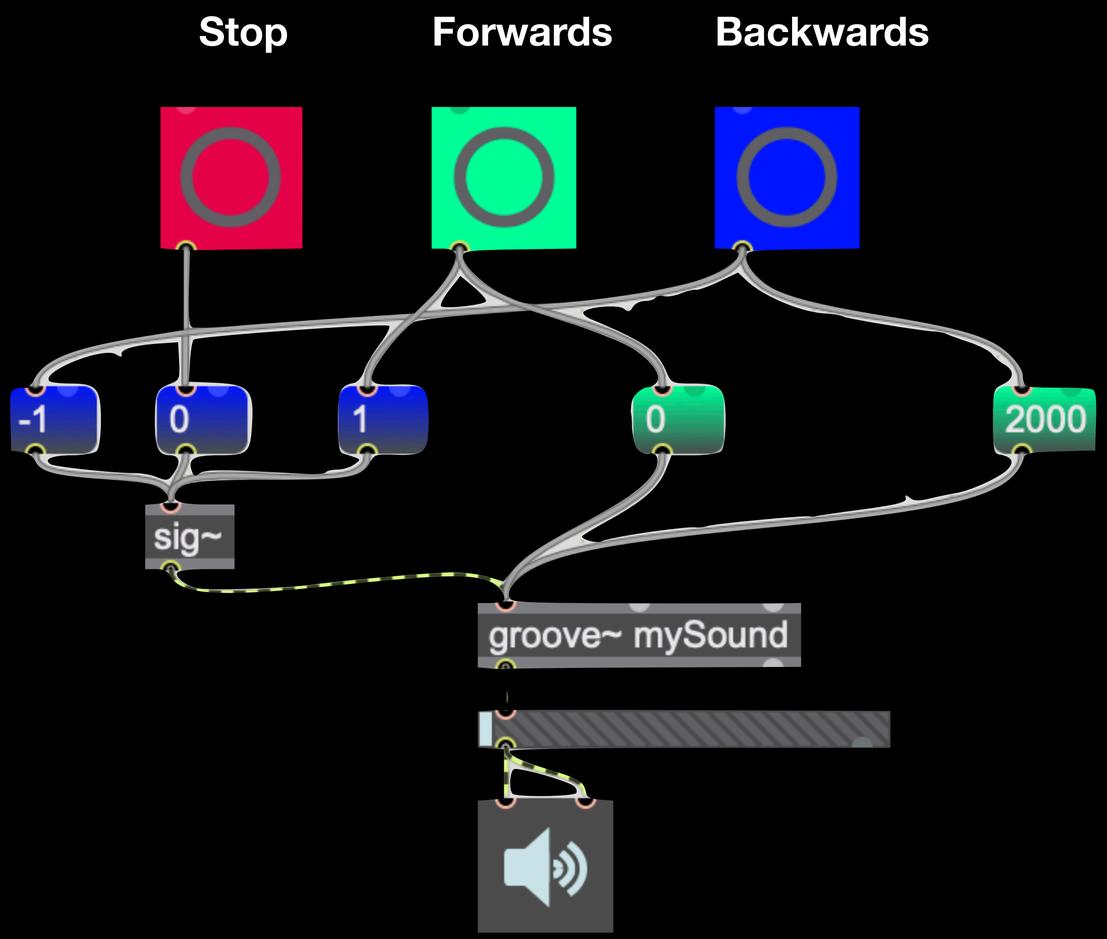
You'll need a buffer~ too containing a sound with a corresponding name.



Sending the signal 0 will make it pause, -1 will play backwards, and 1 will play forwards.

Set time in milliseconds,

You'll need to send both signals, you can connect them to a button to do this.

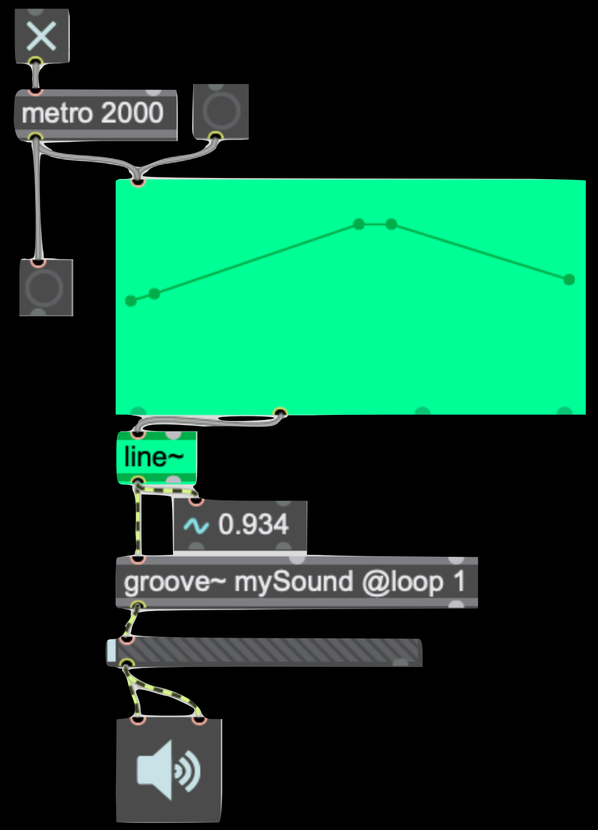


Lets use a phasor~ wave
to change the signal.

Use a slider so you can
adjust the frequency.

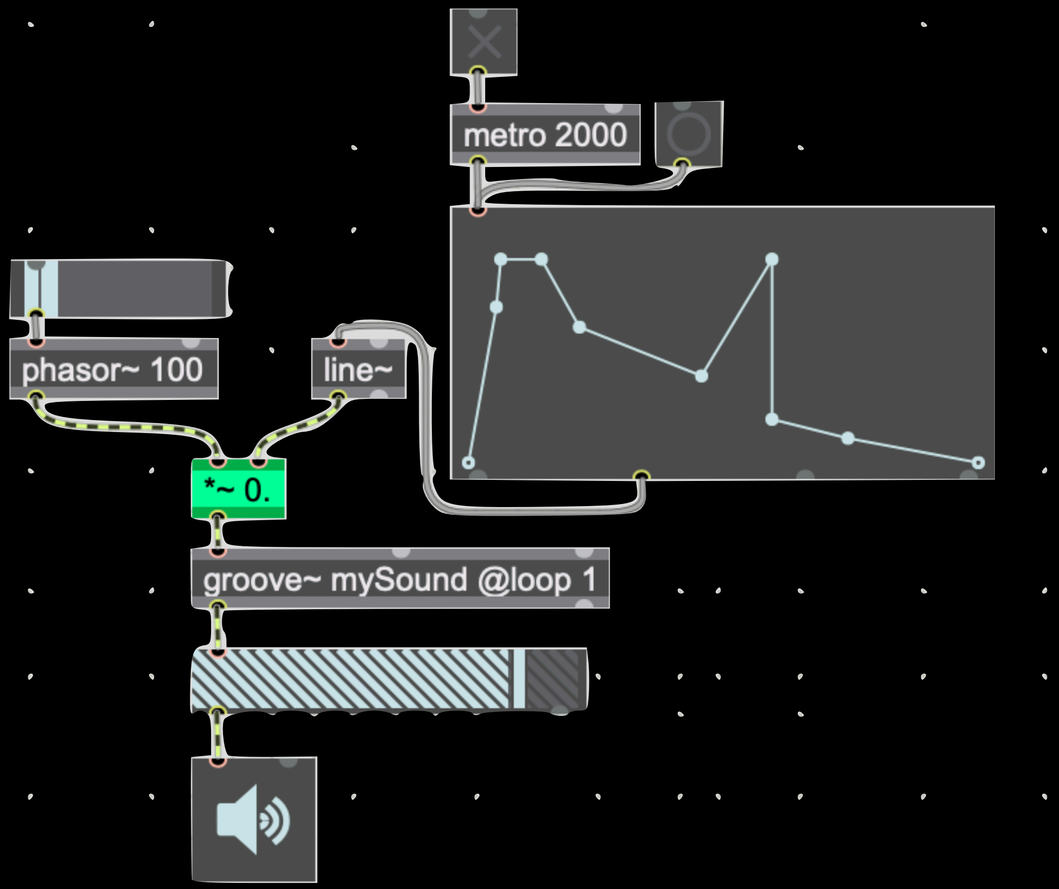
Set the sound to @loop 1
so its always looping

Using function and line~ to modulate the signal speed



Now try using phaser AND envelope. We'll multiply the wave output by the line output to create a signal.

You can use a button or metro to activate ehe line output.

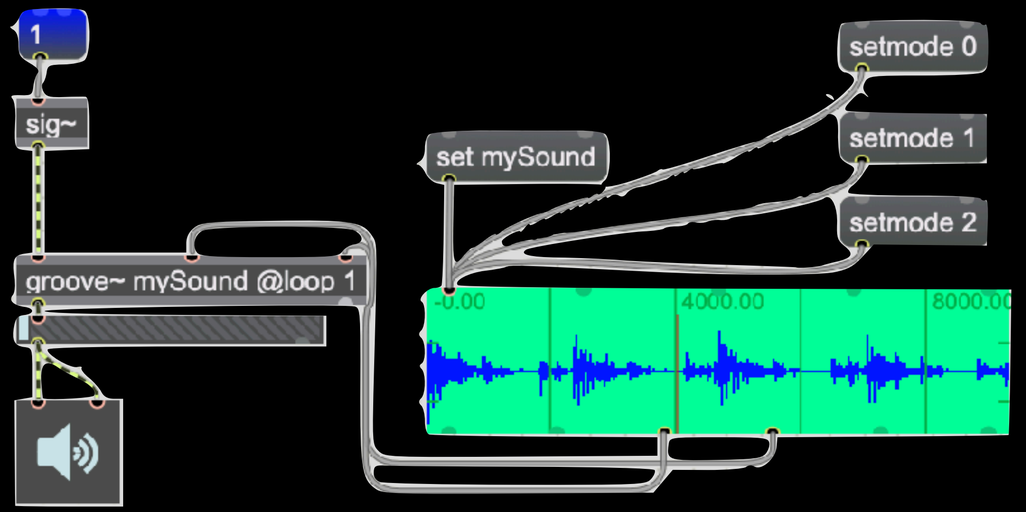


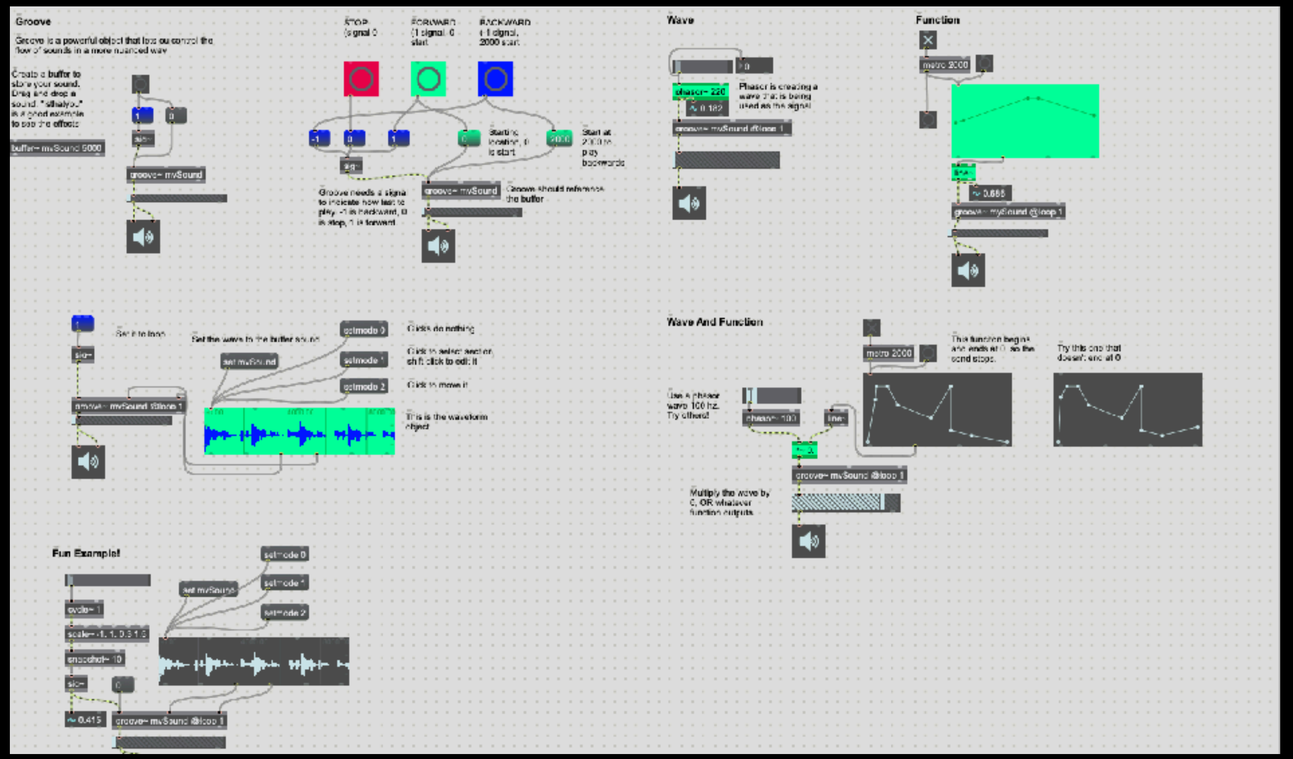
Groove~ can also take start and end points as inputs.

We can use waveform~ to select start and end points.

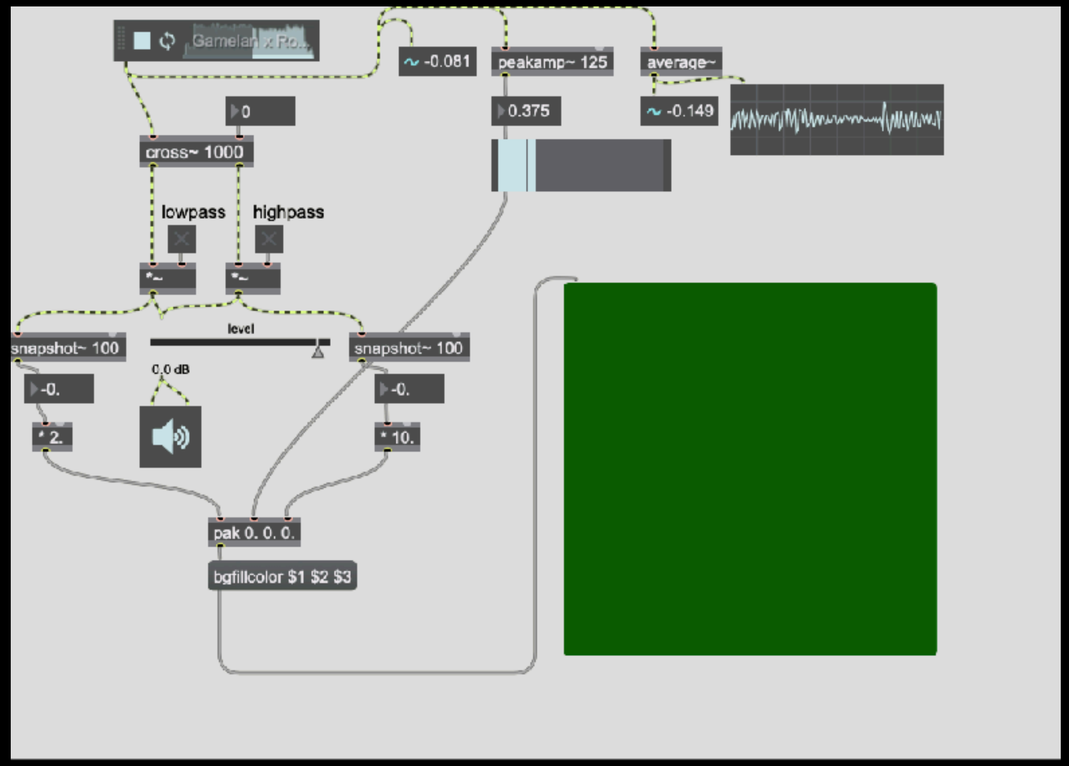
setmode can be used set deferent ways of selection.

Setmode 0 will let nothing happen
Setmode 1 you can click to select
Setmode 2 you can drag your selection.

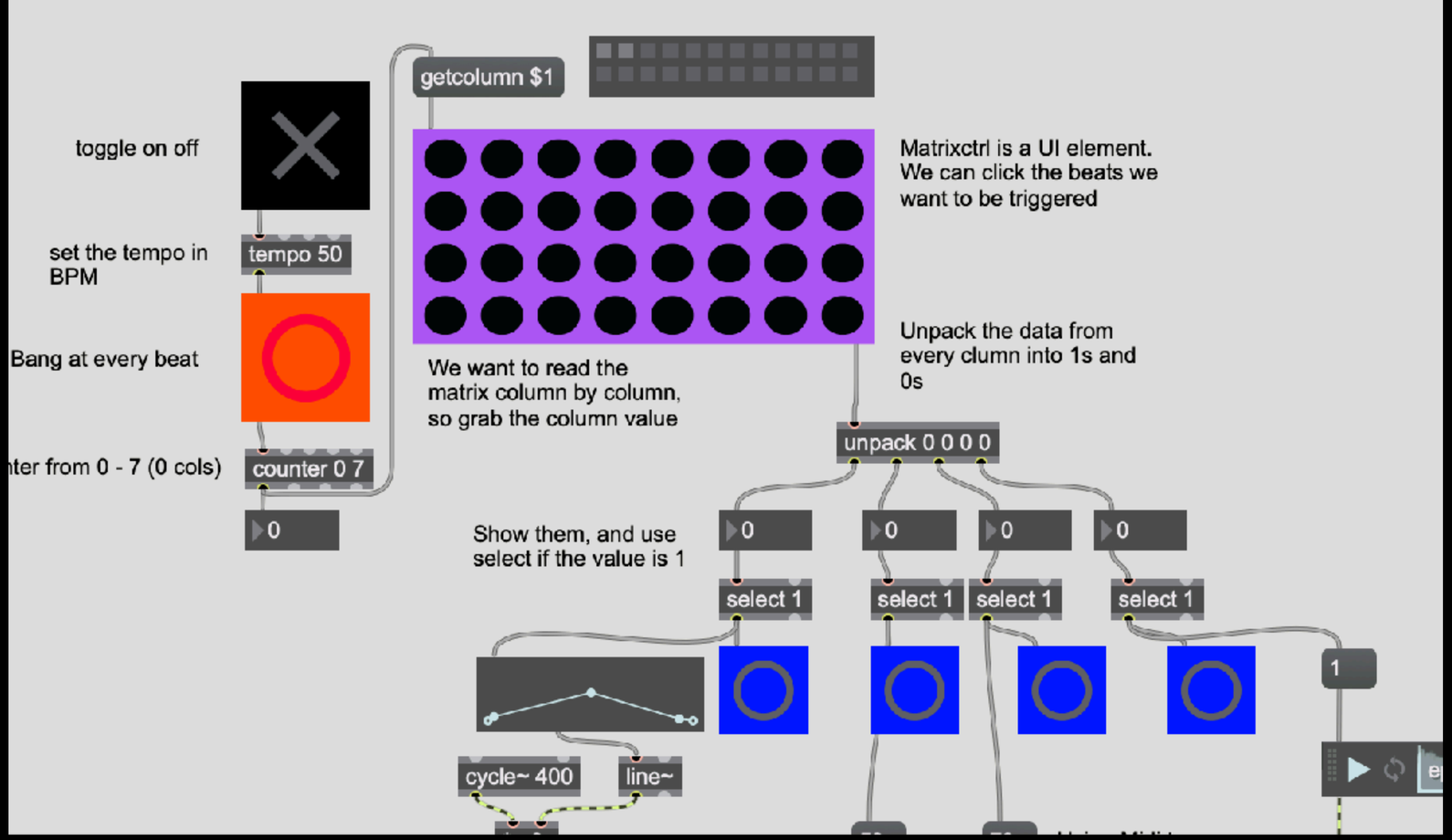




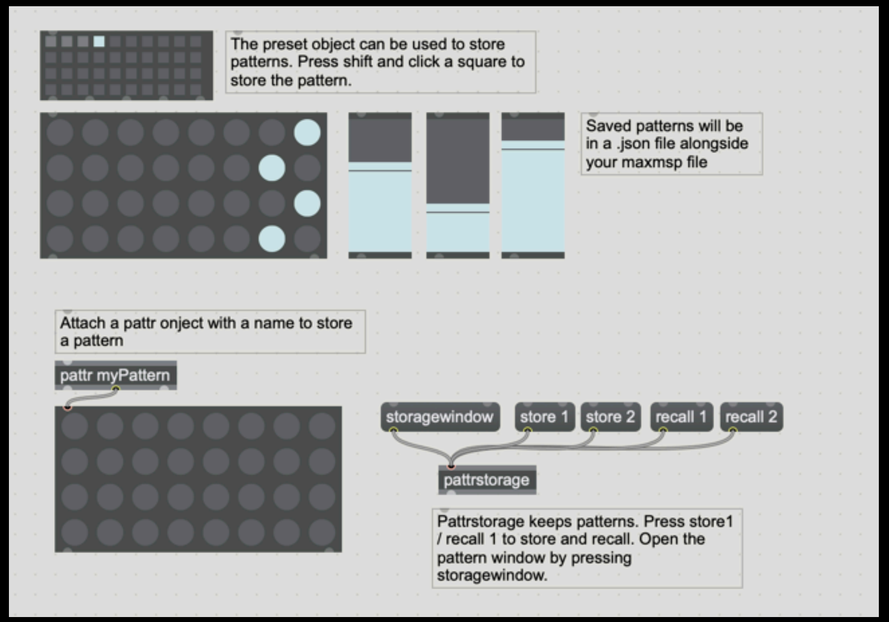
See more on groove_sample_waveform patch



See more on
basic_audio_analysis patch



See sequencer open sequence_pattern_storage.maxpat (include pattern.json in zipped folder)



Store patterns and presets, open pattern_recall.maxpat (Include preset.json in zipped folder)

Think of these as tools to build / mix / expand to create instruments, interactions, experiences.

How can we get out of our desks and experience these sounds?

What movements or interactions do you imagine paired with sounds?

Download todays patch
on Moodle

Midterm: Transform - Groups of 2-3, 25%, October 21

In this project you are invited to look beyond the computer screen and transform a space or atmosphere. Using primarily audio and video (and other if you want to) MaxMSP tools, bring us into a transformed within (or nearby) our classroom. This could mean changing the mood, forcing us to change perspectives, or imagine something new. Your project should **not** appear as a max patch, but as a piece for people to approach and engage with through a linear progression or interactive element. Your work should in some way have an arch or experience that builds or changes throughout the experience.

Be intentional. What do you want us to experience, and how are you bringing us there?

This work should feel complete - take note of where wires and cables are. Use projectors, lights, staging, curation etc to create a space. The work should be approaching gallery-ready state. Freel free to re-arrange any nearby space or reserve a critique room.

Homework:

Work on Audio Experiment (due tonight)

Work on Midterm project
Next week: Video