MUS 6: Electronic Music

Section Lecture 3

Wednesday, October 21, 2020

Lecture Outline

1. Announcements
2. General Information
3. Music Intervals
4. Homework 1 (Ableton Live Basics)

Announcements

- Homework Assignment #1 is DUE by Friday, Oct 23 at 11:59 pm

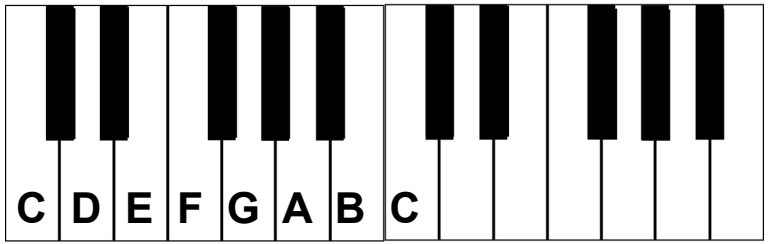
General Information: Student Question

- When I play the low E note on a guitar, I also hear a B note. Does the presence of the B note have something to do with the Fourier series?
  - Yes, it does! The B note you hear (246 Hz) is the 3rd harmonic of the fundamental frequency (82 Hz) of the low E string. That is, **3 x 82 Hz = 246 Hz**.
  - From physics, we know that a guitar string vibration can be described using a Fourier series. For the low E string, the Fourier series is the sum of all appropriately weighted harmonics of the sine wave vibrating at 82 Hz. The B note at 246 Hz is the third member of this series.
  - Let’s use the spectrum analyzer in Ableton to visualize this...

Music Intervals

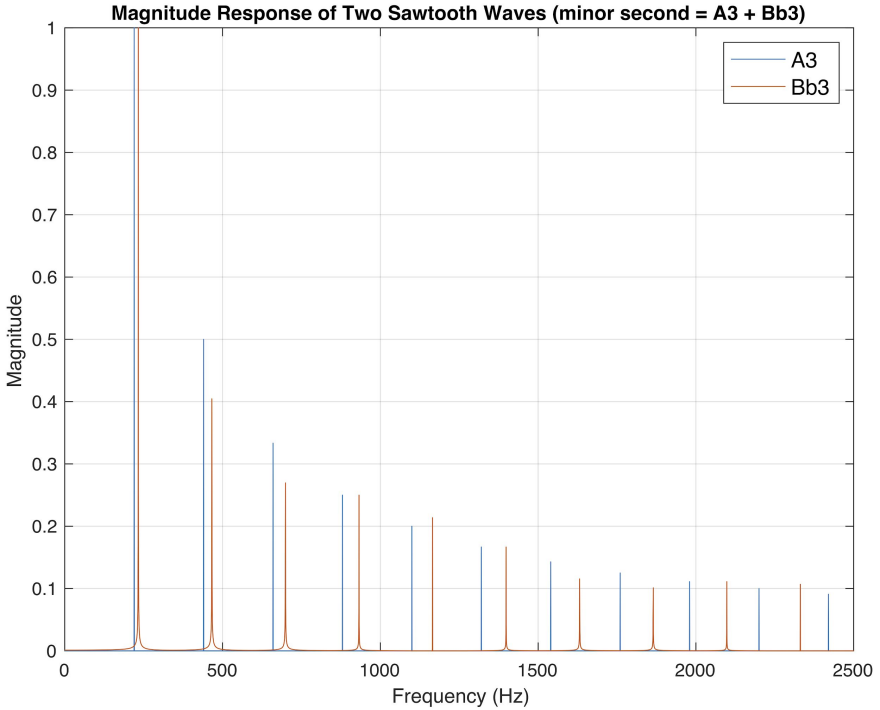
Music Intervals: Definition

- A music interval is **the difference in pitch between two musical tones**
- Pitch is a person's *subjective perception* of frequency. In this lecture, we'll consider pitch and frequency to be synonymous. However, in certain contexts, a person may perceive a different frequency from what is actually played. For example, a person could perceive two frequencies played at 1000 Hz and 1200 Hz as having a fundamental frequency of 200 Hz.



Music Intervals: Roughness

- **Audio Samples:** https://chadmckell.com/intervals
- Some intervals sound more **rough** (unstable) than others. Roughness is caused by our ear's inability to distinguish between multiple tones.
- Several partials of the minor second interval played using two **sawtooth waves** lie close to each other (see plot). This can cause roughness.



Music Intervals: Roughness

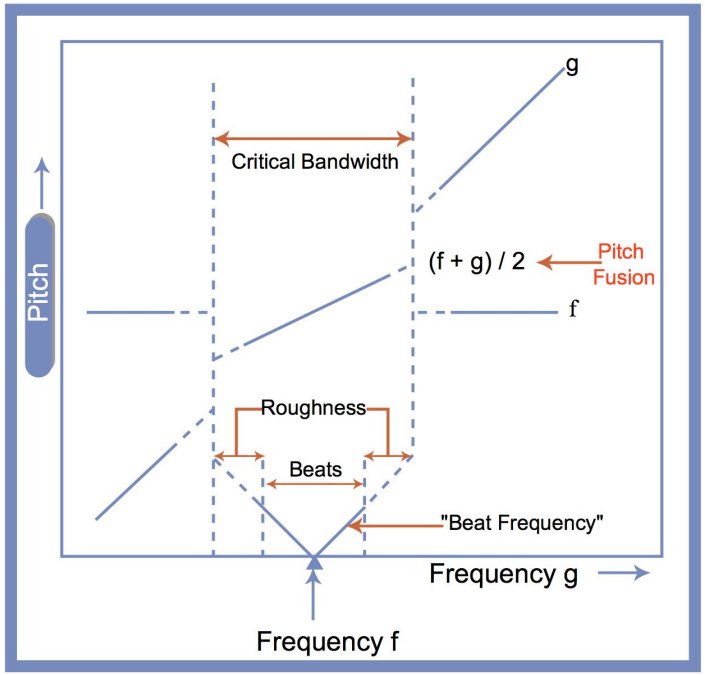


Figure by MIT OpenCourseWare.

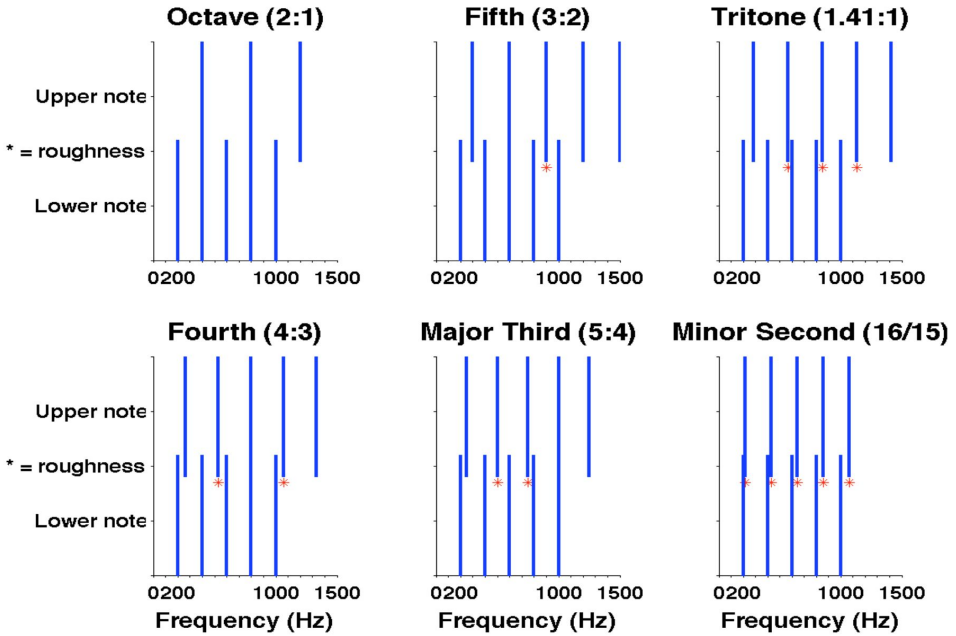


Figure by MIT OpenCourseWare.

Music Intervals: Consonance vs. dissonance

- **Consonant (stable)** intervals sound **less rough** while **dissonant (unstable)** intervals sound **more rough**. The table below shows some consonant intervals associated with “harmonic” instruments (e.g. Western classical).

CONSONANT INTERVALS

Name of Interval	Octave	Fifth	Fourth	Major third	Minor third	Major sixth	Minor sixth
Notes (in Key of C Major)	C-C	C-G	C-F	C-E	E-G	C-A	E-C
Ideal Frequency Ratio	2	3/2	4/3	5/4	6/5	5/3	8/5
Number of Semitones	12	7	5	4	3	9	8

Figure by MIT OpenCourseWare.

Music Intervals: Dissonance graph

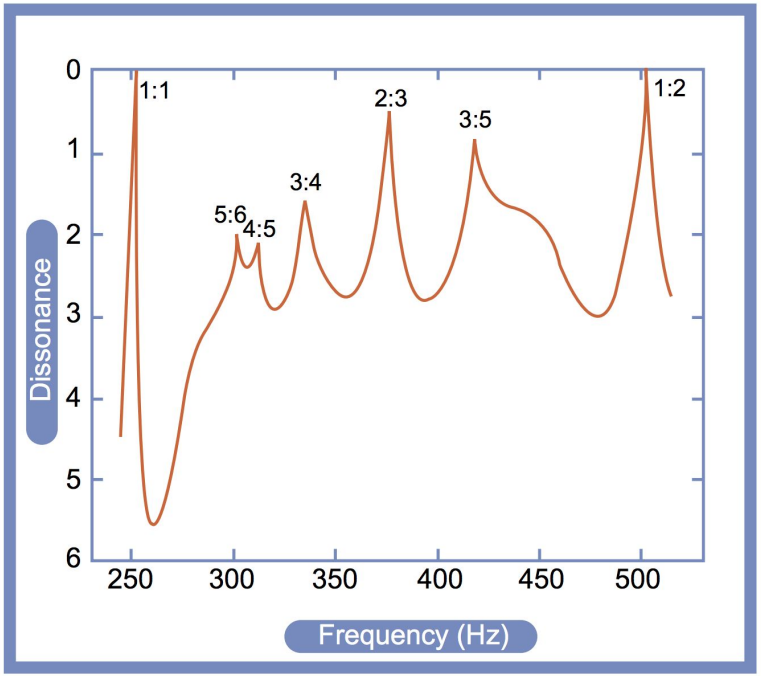


Figure by MIT OpenCourseWare.

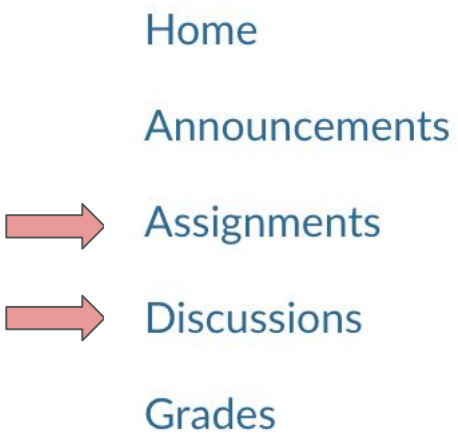
Homework 1 (Ableton Live Basics)

Homework 1: Lecture schedule

- **Previous lectures:**
  - Drum patterns
  - MIDI data
  - Audio samples
  - Favorites bar
  - Automation
- **Today:**
  - Canvas submission guidelines (assignment + discussion)

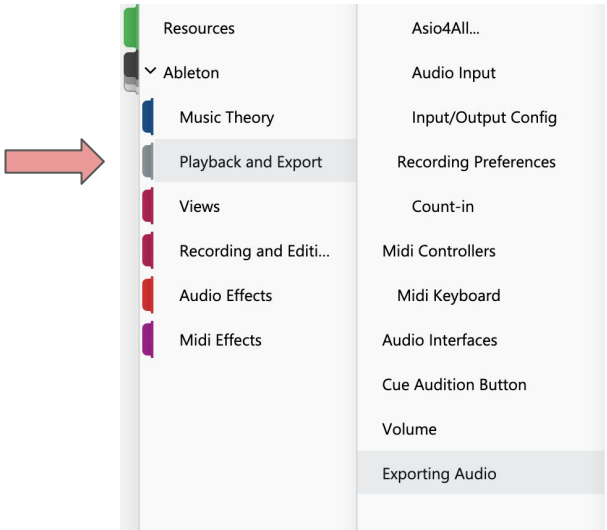
Homework 1: Canvas Submission

- Submit your assignment in two places on Canvas:
  - Under “Assignments”
  - Under “Discussions”
- Include the following in your “Assignment” submission
  - Your audio file (it must be **at least one minute** in duration)
  - A short (2-3 sentence) description for each of the 5 bullet points
  - A screenshot for each of the 5 bullet points
  - A link to your Ableton project folder
- Include the following in your “Discussion” submission
  - Your audio file
  - A brief (2-3 sentence) description of your piece



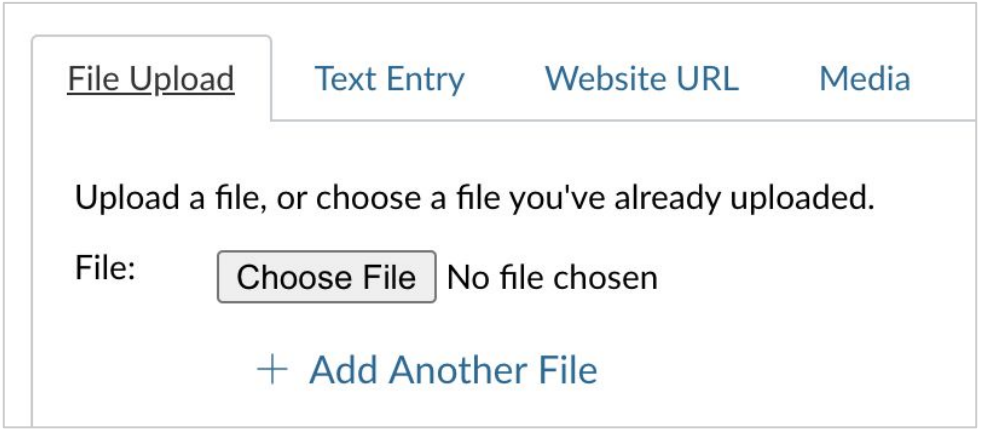
Homework 1: How to export your audio

- Guidelines for exporting your audio from Ableton are posted on OneNote under Playback and Export → Exporting Audio



Homework 1: How to upload your audio file

- Upload your audio file using the “File Upload” tab on Canvas.

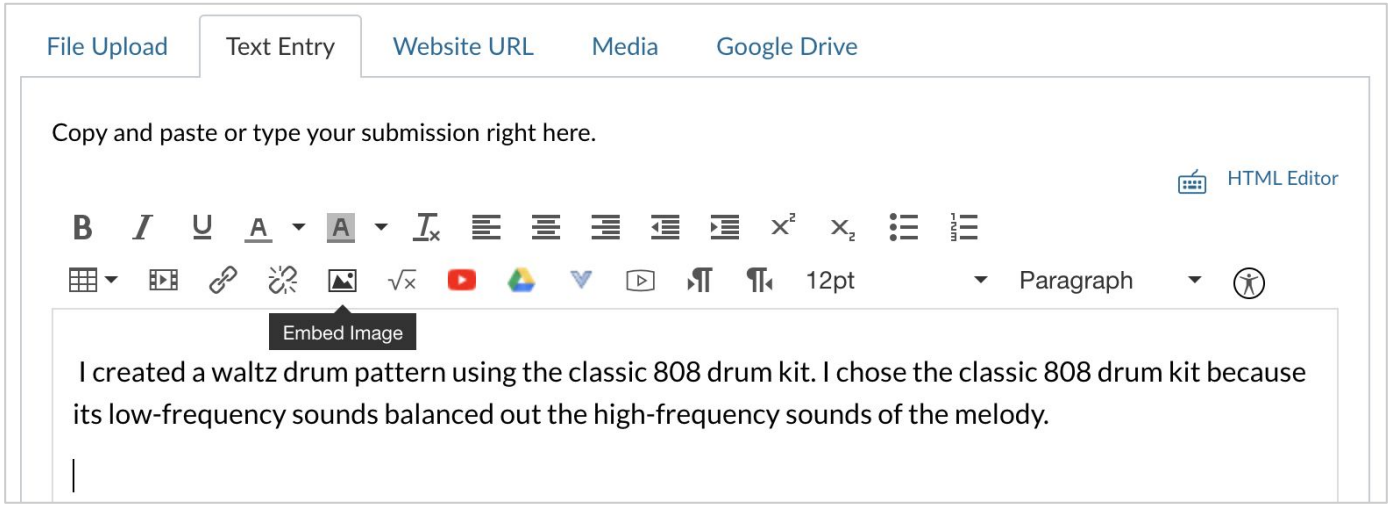


Homework 1: How to write the descriptions

- Add your descriptions in the “Text Entry” tab on Canvas.
- At the bare minimum, you should state what sound or pattern you used for each bulleted item. For example, in bullet point #1 (drum patterns), you could say that you created a waltz drum pattern using the classic 808 drum kit.
- You could also discuss any of the following for each bullet point:
    - Why you chose to use particular sounds or musical patterns
    - What stumbling blocks you ran into and how you overcame them
    - What you like about your piece
    - How you think your piece could be improved
- The description in your “discussion” submission could be a short summary of the descriptions from your “assignment” submission.

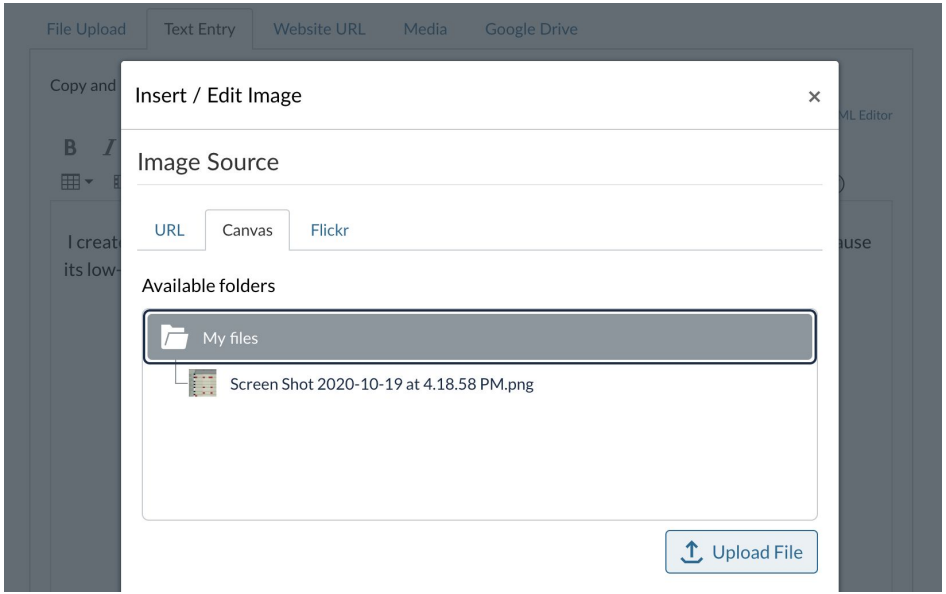
Homework 1: How to embed an image

- First, click the “Embed Image” icon in the “Text Entry” tab on Canvas.



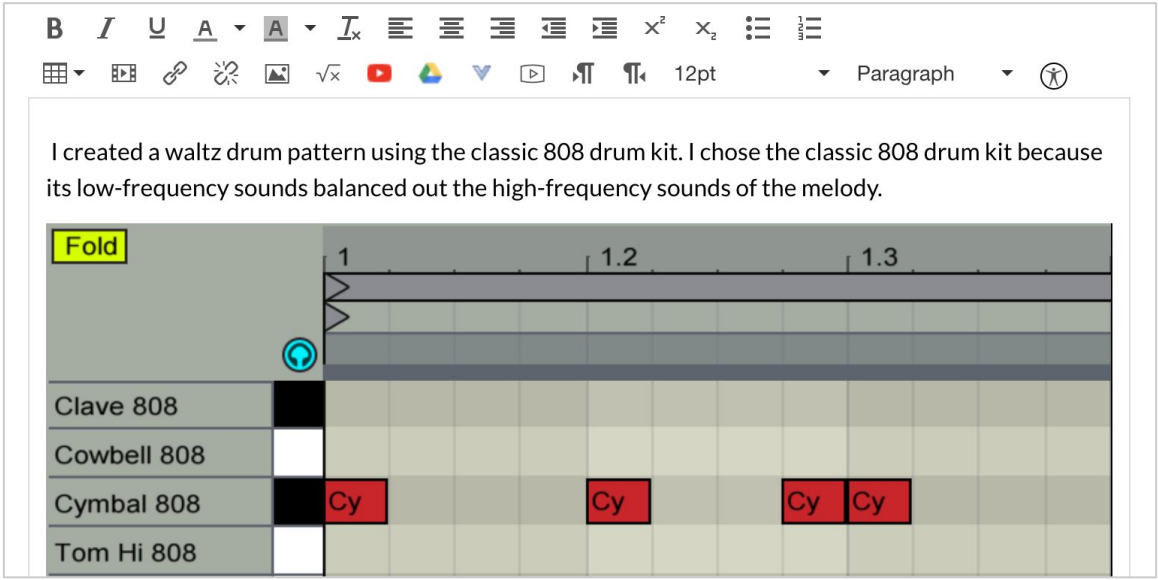
Homework 1: How to embed an image

- Upload your screenshot to the “Canvas” tab. Then, click “Update”.



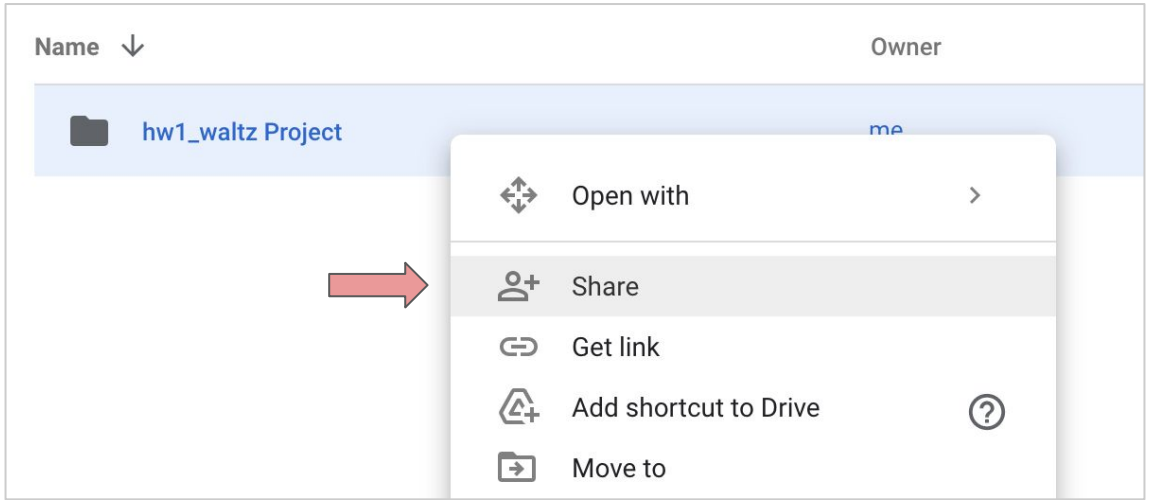
Homework 1: How to embed an image

- Your image should now appear in the text box with your descriptions.



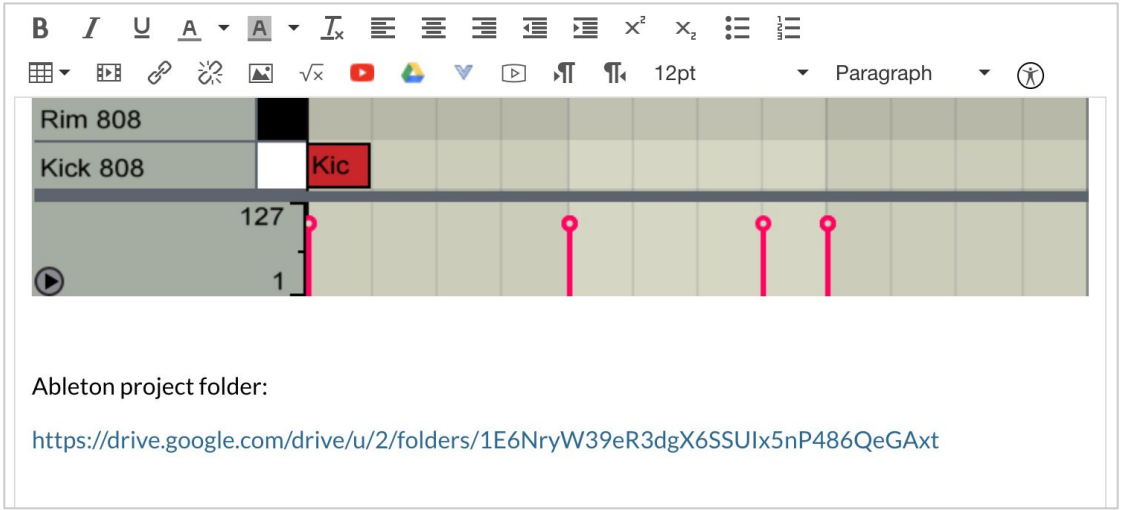
Homework 1: How to share your Ableton project

- Add your Ableton project folder to Google Drive
- Share your folder with your TA (my email is cmckell@ucsd.edu)



Homework 1: How to share your Ableton project

- Copy the URL for your Ableton project folder, then paste the URL in the text entry box (the same box you used for your descriptions and screenshots)



Questions