Music 175: Psychoacoustics
Assignment #2,
Due: Tuesday April 14, 2020

- Download **harmonicity2.pd** from

  `http://musicweb.ucsd.edu/~trsmyth/pdpatches175/harmonicity2.pd`.

  1. Play a 220-Hz "square" and then "triangle" wave;
     - describe the qualitative (or timbral) difference you hear between the tones.
  2. For BOTH 220-Hz "square" and "triangle" waves,
     - change the frequency (first scoll up then down) of the 3rd harmonic until you no longer perceive a fused sound having a clearly defined pitch;
     - note the frequency value above/below the 3rd harmonic;
     - is the change in frequency above the 3rd harmonic different than below?
     - are frequency values different for each waveform?
  3. Reselect "square" wave (this should reset frequencies/amplitudes).
     - repeat above steps for the 7th harmonic (for just square wave);
     - how do values compare to those for the 3rd harmonic?
  4. Reselect "square" wave (reset frequencies/amplitudes):
     - increase the amplitude (shift-scroll) of the 3rd harmonic until you hear a change in the quality (timbre) of the sound—note the value;
     - do the same for the 9th harmonic—note the value;
     - how do values compare?
  5. Reselect "square" wave (reset frequencies/amplitude):
     - lower the amplitude of the fundamental frequency (1st harmonic) until doing so no longer makes a difference in the timbre of the sound;
     - do you still hear the same pitch?

- **Submit on Canvas** as `a2<yourname>.pd` (NOTE: .pd extension).

- Reading: Cook chapter 1 and 6;

- Discussion (D2): Is it possible to change the pitch of the sound by changing the amplitudes of the harmonics? You can discuss based on your results here, but you may also experiment by changing additional values in harmonicity.pd).