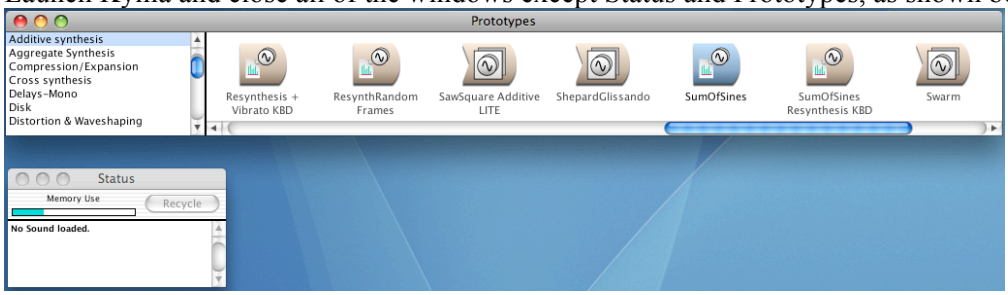
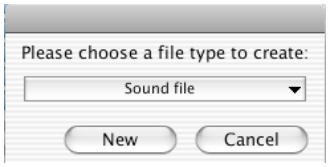
**Composition: Electronic Media II**
**Spring 2009**
**Spectral Synthesis in Kyma Part 1**

1. To play a spectral file, use the SumOfSines prototype. This module allows you to:
   a. Open up to 2 spectral files in the same module.
   b. Change the frequency of one or both of them.
   c. Change the playback speed of one or both of them
   d. Move through the spectral snapshots of one or both of them.
   e. Perform such cross-synthesis techniques as morphing.

2. Launch Kyma and close all of the windows except Status and Prototypes, as shown below:

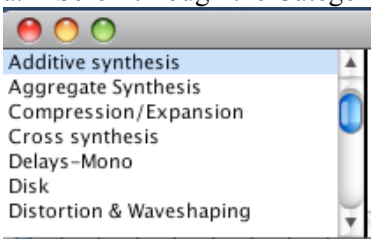



3. Create a new Sound file as follows:
   a. Select File>New. A window like the one below will appear:

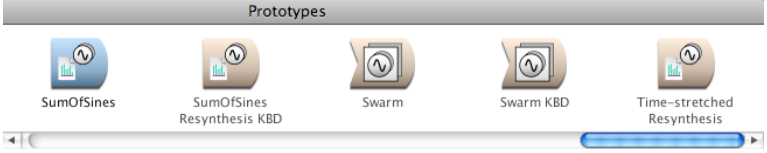



   b. Select Sound file and click on New. A window like the one below will appear. This window is a Sound file and behaves somewhat like a folder, as will be discussed in class.

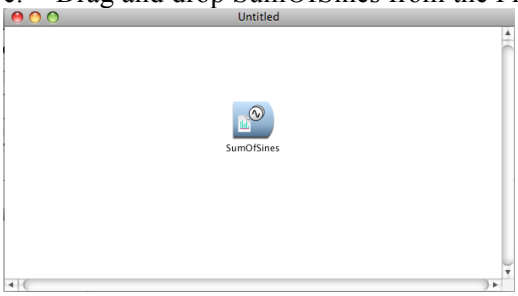

4. Place a Sum of Sines prototype into the Sound file as follows:
   a. Scroll through the Categories window on the left and select Additive synthesis, as shown below:



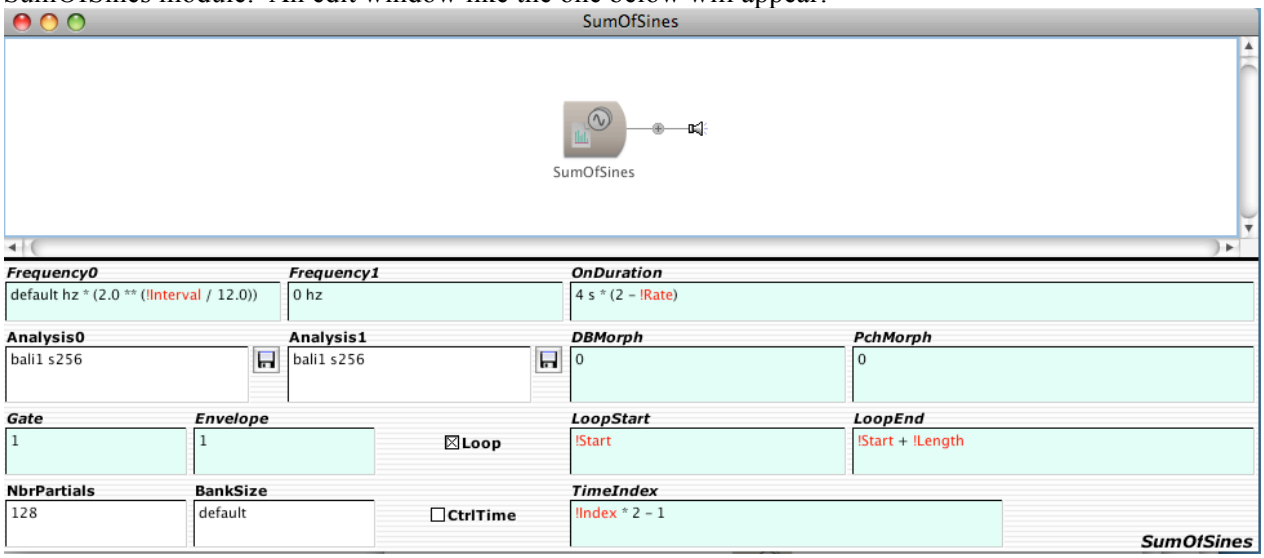

   b. Scroll through the Prototypes window on the right and select SumOfSines, as shown below:



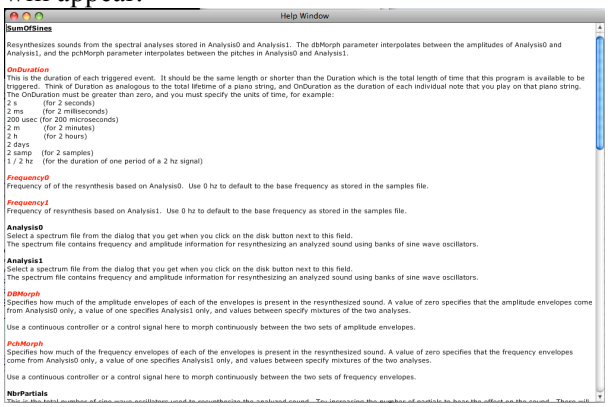
c. Drag and drop SumOfSines from the Prototypes window onto the Sound file, as shown below



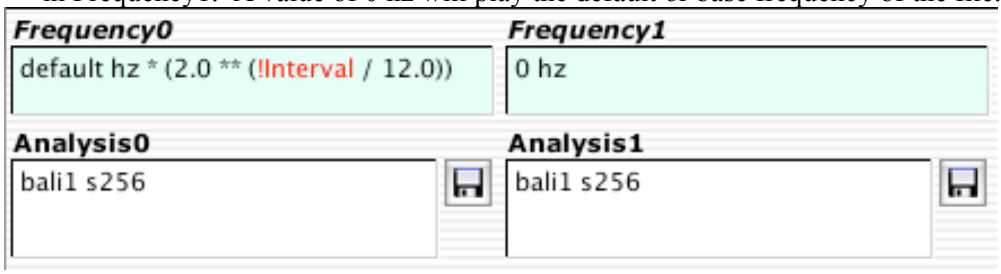

5. To edit the SumOfSines module (formerly a Prototype, now a Sound in Kyma terminology), double-click on the SumOfSines module. An edit window like the one below will appear:



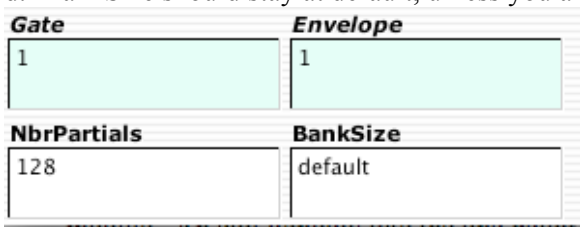

6. For a description of the functions of this, or any, Sound, go to Info>Describe Sound. A window like the one below will appear:



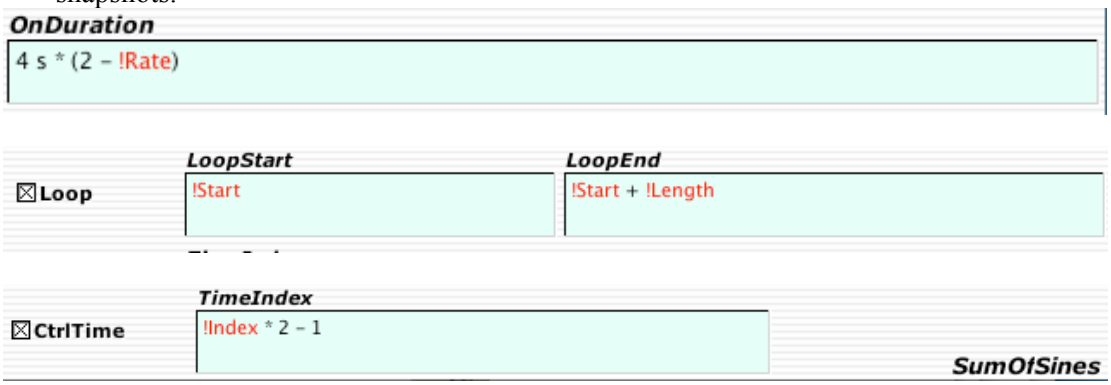
7. Looking at the screen shot shown below, consider the following:
   a. Analysis0 has a disk icon that opens any spectral file created in Kyma.
   b. Analysis1 has a disk icon that opens any spectral file created in Kyma.
   c. The frequency of Analysis0 is controlled in the window labeled Frequency0.
   d. The frequency of Analysis1 is controlled in the window labeled Frequency1.
   e. In the spectral domain, frequency is independent of speed of playback.
   f. The frequency can be controlled by a slider, as shown in Frequency0 or by typing in a specific value, as shown in Frequency1. A value of 0 hz will play the default or base frequency of the file.




8. Looking at the screen shot shown below, consider the following:
   a. Gate will trigger playback when the number is greater than 0. We will later use a special trigger controller for this.
   b. Envelope will control loudness. The word "envelope" is equivalent to "volume" in Kyma terminology.
   c. NbrPartials determines how many partials or harmonics will sound during playback. If processing speed becomes an issue, this number can be reduced.
   d. BankSize should stay at default, unless you are an advanced user and need to control processing speed.




9. Looking at the screen shots below, consider the following:
   a. OnDuration sets the amount of time in which the sound plays back. A small value means the sound will fit into a small playback window, this playing faster. A large value means the sound will fit into a large playback window, thus playing slower. In the spectral domain, speed is independent of frequency or pitch.
   b. When the Loop box is checked, playback will be looped and LoopStart and LoopEnd will be active.
   c. LoopStart controls where in the spectral file playback begins within an "index" range of 0 to 1, where 0 is the beginning of the file and 1 is the end.
   d. LoopEnd controls where in the spectral file playback ends within an "index" range of 0 to 1.
   e. When the CtrlTime box is checked, playback will be controlled by TimeIndex.
   f. TimeIndex lets the user manually or automatically select any position in the spectral file and hold it until moved to another position. Think of the analysis as a series of snapshots. The TimeIndex lets you navigate through these snapshots.



10. Looking at the screen shot below, consider the following:
    a. DBMorph specifies how much of the amplitude (hence “DB” for decibels) envelopes of each of the envelopes is present in the resynthesized sound. A value of zero specifies that the amplitude envelopes come from Analysis0 only, a value of one specifies Analysis1 only, and values between specify mixtures of the two analyses.
    b. PchMorph specifies how much of the frequency envelopes of each of the envelopes is present in the resynthesized sound. A value of zero specifies that the frequency (hence “Pch” for pitch) envelopes come from Analysis0 only, a value of one specifies Analysis1 only, and values between specify mixtures of the two analyses.