Composition: Electronic Media I
October 10, 2005
Intro to Max/MSP

1. Discussion of the premises, history, features, and uses of **Max/MSP**.
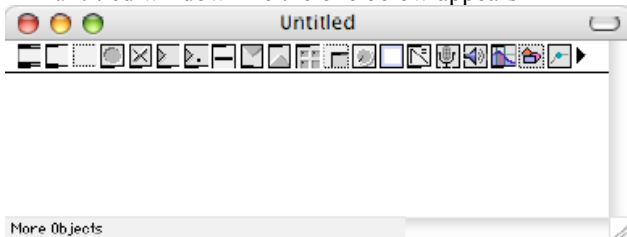
2. Launch **Max/MSP** as follows:
    a) Bring up mixer faders 1,2,9,10.
    b) Assign the faders to the desired buses and output channels.
    c) Launch **Max/MSP** by selecting its icon in the dock,

    d) Close all window that may appear.

3. Open a new **Patcher Window** as follows:
    a) Select **File>New Patcher**
   b) An untitled window like the one below appears

    c) Notice the icons along the top. These icons are part of the **Object Palette.** The **object palette** can be turned on or off by selecting View>Hide Object Palette or View>Show Object Palette.
    d) Notice the button in the upper right corner. This is the **lock**/**unlock** button.
        1. To compile or play a patch, you must lock it by pressing the **lock** button.
        2. Notice that when a patch is locked, the **Object Palette** disappears.
        3. To unlock a locked patcher, click the **lock/unlock** button and the patch is thus unlocked.
        4. In summary, a locked patcher enables a patch to be played. An unlocked patcher allows a patch to be edited.

4. Patches are created by dragging objects from the palette, placing them in the screen, then interconnecting them with virtual patchcords.

5. Prepare to drag an object onto the screen as follows:
    a) Select Options>New Object List.
    b) Drag the leftmost object from the palette and notice that the cursor turns into the object.
    c) Click the cursor on the screen to place the object. Notice that an object list like the one below appears:
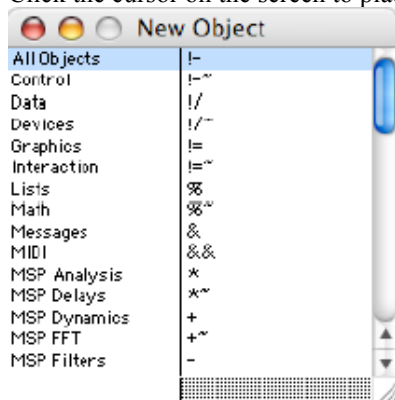
    d) Items in this list will be discussed in class.
        1. Note the object names that do <u>not</u> end with a ~ (tilde). These are Max objects.
        2. Note the object names that <u>do</u> end with a ~. These are MSP objects.

3. In summary, Max objects use think black line patch cords and are control signals, not audio. MSP objects use gold and black braided line patch cords and are audio signals.

6. Several important objects are:

        Object Box. Creates Max or MSP objects. Notice inlets on top and outlets on bottom.

        Message Box. Used for Messages like "Start", "Stop", "Open". Notice inlet on top and outlet on bottom.

        Comment Box. Used for comments like "Larry's Patcher". Notice no inlet or outlet.

        Button. Used to trigger events with Bang messages. Notice outlet on bottom.

        Toggle. Used to toggle between states such as "on" and "off". Notice outlet on bottom.

        Number Box. Used to generate numbers (integers—whole numbers). Notice inlet on top and outlet on bottom.

        Float Number Box. Used to generate decimal point numbers (such as 1.112). Notice inlet on top and outlet on bottom.

7. Create a **dac~ object** as follows:
    a) Drag an **Object Box** into the **Patcher** and position it in the lower middle part of the window
    b) Disregard the **Object List** window.
    c) Type "dac~" into the **Object Box**, as shown below:

        `dac~`

    d) Notice the following:
        1. "dac" stands for digital to analog converter. It converts digital sounds into analog audio sounds.
        2. The ~ (tilde) sign indicates that the object is an audio or MSP object.
        3. The dac~ object has a left audio inlet and a right audio inlet.
        4. You can make the object box longer by grabbing the right side and resizing.

8. Create "start" and "stop" **Message Boxes** as follows:
    a) Drag a **Message Box** into the **Patcher** and type "start".
    b) Drag another **Message Box** into the **Patcher** and type "stop".
    c) Arrange these boxes to the left and above the **dac~ object**.
    d) Patch the **Start** outlet to the **dac~** left inlet.
    e) Patch the **Stop** outlet to the **dac~** left inlet.
    f) The **Patcher** should like this:

        `stop`   `start`
                       `dac~`

    g) Notice the following:
        1. The **dac~** needs to be turned on and off. "Start" and "stop" accomplish this.
        2. These patch cords are radial. Segmented patch cords are another option (see the **Options** menu).
        3. The patch cords are plain, black lines, which indicate that these are control signals, not audio.

9. Create a **Signal Multiplier Object** as follows:
    a) Drag an **Object Box** into the **Patcher** and position it above the **dac~ object**.
    b) Type "*~" into the **Object Box**.
    c) Patch the **Signal Multiplier** outlet to the **dac~** left and right inlets.
    d) The **Patcher** should look like this:

                       `*~`
        `stop`   `start`
   `dac~`

    e) Notice the following:
        1. The **Signal Multiplier** will be used to control the volume of the left and right channels of the **dac~**.
        2. The patch cords are dashed, yellow and black lines, which indicate that these are audio signals, not control signals.

10. Create a **Float Number** object as follows:
    a) Drag a **Float Number Box** into the **Patcher** and position it above and to the right of the **Signal Multiplier**.
    b) Patch the **Float Number** left outlet to the **Signal Multiplier** right inlet.
    c) The **Patcher** should look like this:
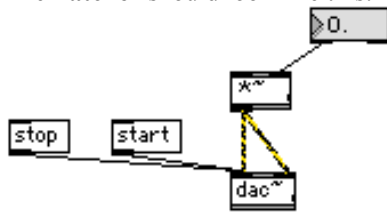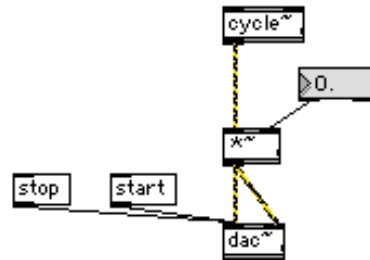

    d) Notice the following:
        1. The **Float Number Box** will be used to supply a decimal number to the **Signal Multiplier**.
        2. This decimal number will function as a volume control for the **dac~**.

11. Create a **cycle~** object as follows:
    a) Drag an **Object Box** into the **Patcher** and position it above the **Signal Multiplier**.
    b) Type "cycle~" into the **Object Box**.
    c) Patch the **cycle~** outlet to the **Signal Multiplier** left inlet.
    d) The Patcher should look like this:
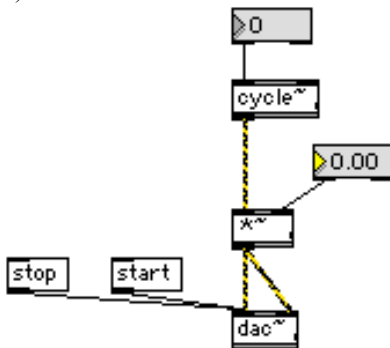

    e) Notice the following:
        1. The **cycle~** object is a sine wave.
        2. The patch cord is an audio signal.

12. Create a **Number Box** object as follows:
    a) Drag a **Number Box** into the **Patcher** and position it directly above the **cycle~** object.
    b) Patch **Number Box** left outlet to the **cycle~** object left inlet.
   c) The **Patcher** should look like this:

    d) Notice the following:
        1. The **Number Box** will function as a frequency control.
        2. The patch cord is a control signal.

13. Play the patch as follows:
    a) Lock the **Patcher**.
    b) Press "start".
    c) Adjust the volume from the **Float Box**.
    d) Adjust the frequency from the **Number Box**.
    e) Press "stop" to stop the sound.

14. To learn more about the cycle~ object, unlock the patcher, highlight cycle~, and select from the menu Help>'Help on cycle'. A window like the one below will appear:
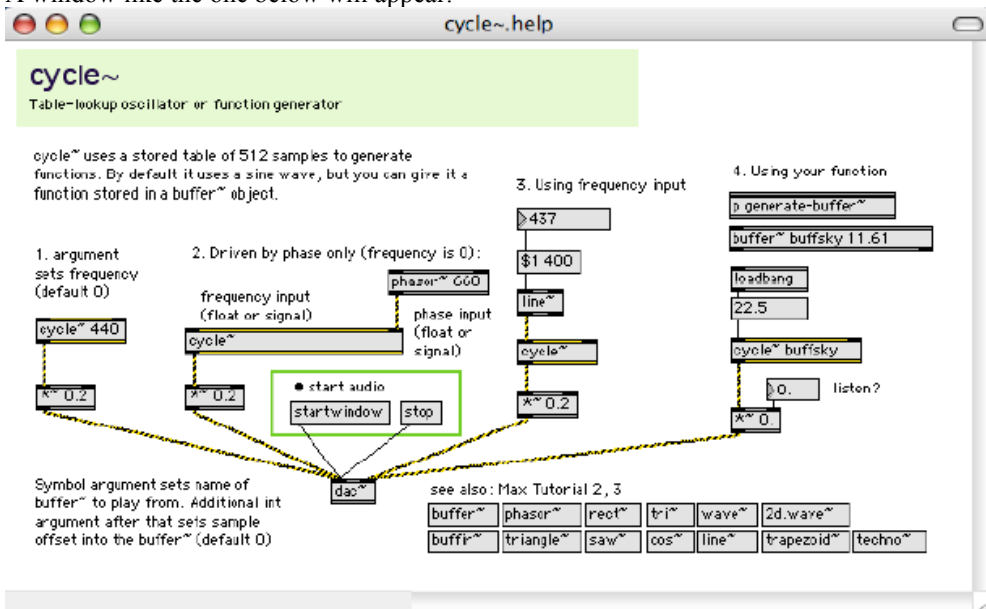
Note the following:
a) Most objects have similar help windows.
b) Items from a help window can be unlocked, copied, and pasted.
c) Each item from a help window also has its own help window: unlock, highlight, select Help>'Help on object'.
d) Beware of running multiple dac~s.
e) Notice the different waveforms in the lower right hand corner. Experiment with some of these in class.

15. Consider the following options:
a) Control:
   1. Equations
   2. Randomness
   3. MIDI
   4. Audio
   5. Video
   6. Computer input devices
   7. Gloves, tablets, light beam, etc.
b) Sound:
   1. Synthetic waveforms
   2. Audio files
   3. Microphone
c) Video:
   1. Picture files (jpeg, etc.)
   2. Video files
   3. Live video

16. Save, name, and store the patch, then quit **Max/MSP**.