

Music Challenge: Part the Second**Due: February 18th**

Now we want to revise our song so it has a little more character. I also want you to get some practice at writing a script that calls a function. To do this we will be using a function created by an IPFW student Josh Arnold and modified by Scott Moor. This functions adds odd numbered harmonics (multiples of your note) together to create a pseudo-square wave. The function is called makesquare2 and can be downloaded from www.engr.ipfw.edu/~moor/121 The call to makesquare2 is shown below.

```
note = makesquare2(f, sf, amp, dur)
```

Where

note = the resulting series for a given note

f = the frequency of the note

sf = the sampling frequency (and must be the same for all notes)

amp = the amplitude and is a number between zero and one

dur = the duration of the note in seconds.

For example if you wanted to create a series representing A4 that was $\frac{1}{4}$ second long, at full amplitude, for a sampling frequency of 20,000 and store it in a variable "A4_q". You would type:

```
A4_q = makesquare2(440,20000,1,0.25);
```

Note: Do not forget the semicolon; this command produces thousands of numbers.

You will use this function in the place of creating the time series and sin wave series yourself. This function will make your notes a little "fuller" sounding and also will allow you to easily vary the amplitude and duration of each note as well as its frequency. For this more complex wave it is usually helpful to increase the sampling frequency. Most computer sound cards cannot handle sampling frequencies greater than 44,100 Hz (the sampling rate of a standard audio CD).

Modify your original song script to make use of this sub-function instead of creating the notes with the sin function yourself. Your new song must now include significant variation in the frequency (note), duration and amplitude of the notes. Make sure you update the help file to note the new capabilities. As with part the first you should email me your .m file.