Note:

1. About resample

The assignment spec requires that the sound file is sampled at 16kHz. If the sound file provided is sampled at a different rate (eg 44.1kHz) then you need to re-sample" it to 16kHz. This can be done with the "resample()" function. Note that the code skeleton defines a tolerance of 10% (fTolerance = 0.1). If you are within 10% of 16kHz.... then this is close enough.

Obj has a specific meaning in computer science terms that we can discuss in the lab if this is interesting.

For the assignment you can completely ignore the obj parameter. You will see in the provided function "cochlearProc.m" that when getWav is called only one parameter is passed.

The only time that you need to use obj is to access data or other functions in the skeleton. see p6 in the assignment tute that I presented in the lab.

1. About Hann function

The idea of the hann window is that ensures that the values at the ends of each epoch are zero. This means your option a) is the right one.

It is possible to split into epochs with the required overlap, make a hann vector and apply to all epochs in 3 statements.

1. Number of epochs

Please refer to point 2) at the bottom of page 3 of the assignment spec.

The duration of each epoch is 2mS + an overlap of 6mS = 8mS. i.e. the duration of each epoch is independent of the total sound duration.

Note that the samples are overlapped. Refer to the tutorial presentation I made in the lab for a graphical view of the overlap. The buffer function is your friend in achieving the overlap efficiently (one statement).

1. CIS timing

I was asked the question today in the lab "How do we represent the timing of CIS stimulation in the code part of the assignment?"

The answer is.... "you don't"

Each column of the FTM contains the magnitude of stimulation that should be applied to electrodes in a 2mS period. The sequencing of the pulses for particular electrodes would be determined downstream. This information is not represented in the code for this assignment.

Of course, in the 4 page paper you submit you should describe all aspects of the processing strategies that you consider relevant from your research on the topic.

1. Error in process() function comment

The comment in the process() function of the code skeleton is as shown below.

The second paragraph (struck through) is an error and should be ignored. Process() should receive data in the form of an FTM for each of the 3 processing strategies.

       function result = process(obj, data, type)

       %  
        % Apply cochlear sound processing as defined by <type> to <data>   
        % and return the modified data.  
        %  
~~% <data> will be a wav vector for formant based processing;~~  
~~% otherwise an ftm.~~  
        %  
        % The different processing types are defined by procXxxxx in the  
        % constant sections of the class.  
        %

1. CIS and SPEAK Strategies

Your research will probably tell that CIS originally had a relatively small number of electrodes. All electrodes were stimulated sequentially. I suggest you follow the "all" approach as the idea behind CIS was not an n of m approach.

SPEAK is definitely an n of m strategy. In real cochlear implants "n" is typically around 8. I recommend that you choose a value in the range 6-10 based on what you think sounds best.