This assignment consists of two exercises, one basic and one ambitious.

1. Basic:
Download the workspace "Top_100_male_midwestern.mat" from the course website. It contains the 100 most common words in the English language, spoken by a Midwestern male. Each sample is 2 seconds long and was sampled at 44.1 kHz.
Your program should do the following:

a) Load the workspace with this data. As usual, you can assume that it is in the same directory as your program.

b) Create a figure depicting the amplitude over time of all 100 words. Do this by showing each word in a subplot. Arrange these subplots in a 10x10 grid. To make it more readable, remove the axis labels (axis off), maximize the figure and title each subplot with the word that is sounded out.

Suggestion: The format of original data files is often awkward. Thus, a reformatting/preformatting step is usually required or recommended. This is no exception. The 100 vectors representing the 100 words are represented in individual matrices with unique names, which makes them hard to access. In addition, header information (in this case, sampling rate in the variable "fs" and the bit-rate (in the variable "bit") is mixed in. Thus, the suggestion is to note this information somewhere, then delete both header information variables in order to have a workspace that only contains data. Then, arrange all of this data in a structure that you can loop through. A command like `DATA = whos` will do that. You can now access each piece of the data and plot it with a command like `plot(eval(DATA(1).name))`. Note that this is just a suggestion. You don't have to do it that way. There are many other ways, but this is what I would do.

c) Create figures depicting the spectrogram of 4 words (pick any 4 you want). Do this by showing each word in a subplot. Arrange these subplots in a 2x2 grid. Maximize the figure and title each subplot with the word that is sounded out. Use 512 frequency points in the y-direction (nfft) for each spectrogram.

Make one figure with spectrograms with a hamming window of length 8 and an overlap of 7. Make another figure with spectrograms with a kaiser window of the same length and overlap. Make two more figures. One with spectrograms with a hamming window of length 256 and an overlap of 255, another one with a Kaiser window, of the same length and overlap.

Note: This will take a while. That is normal.

2. Ambitious:
a) Figure out the boundary conditions why it sometimes takes excessively long to make the plots (or sometimes even doesn't even finish at all)
b) What do you hear when you add all of these words together and play it?
c) Sampling: Plot one second of a sine wave with a frequency of 10 Hz at a resolution of 10,000 points. For a second figure, sample from this sine wave (at regular intervals) at frequencies ranging from 6 Hz to 40 Hz. Plot the shapes that result from this subsampling in a single figure with 35 subplots (I recommend a 5x7 arrangement), one per sampling frequency.