This exercise is to be handed in at the beginning of lab; no lab quiz!!!

STEP 1: It is a **very** hot day in Dallas, and the speed of sound is 400 m/s. Given the formula c=331±0.6C, determine the present temperature. (We will use c=400m/s for the pre-lab exercise ONLY to make the numbers come out nicely.)

STEP 2: OPEN PIPE: Draw the resonant standing wave patterns corresponding to the lowest 3 frequencies of an OPEN pipe. (You may draw pressure or displacement--your choice.)

$$L = \frac{\square}{2}\lambda$$

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You should observe a pattern. We will now calculate the frequency.
If $\mathbf{L=(N/2)\lambda}$ where N=1,2,3..., then $\mathbf{1/\lambda=2L/N}$. Using $\mathbf{c=\lambda f}$, we have:

$\mathbf{f = \frac{c}{\lambda} = \frac{c}{2L} N.}$ Use this formula, with c=400m/s to compute the first 3 resonant frequencies.

For the length of the pipe, assume L=1m.

STEP 3: CLOSED PIPE: Draw the resonant standing wave patterns corresponding to the lowest 3 frequencies of an CLOSED pipe. (You may draw pressure or displacement--your choice.)

$$L = \frac{\square}{4}\lambda$$

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$$L = \frac{\square}{4}\lambda$$

You should observe a pattern. We will now calculate the frequency.
If $\mathbf{L=(N/4)\lambda}$ where N=1,2,3..., then $\mathbf{1/\lambda=4L/N}$. Using $\mathbf{c=\lambda f}$, we have:

$\mathbf{f = \frac{c}{\lambda} = \frac{c}{4L} N.}$ Use this formula, with c=400m/s to compute the first 3 resonant frequencies.

For the length of the pipe, assume L=1m.

STEP 4: COMPARISON:

Fill in the following tables. (Yeah, we only calculated the first 3 resonances, but you're smart and can figure out the pattern--we make use of this in the lab.)

OPEN PIPE	
Resonance	Frequency
1	
2	
3	
4	
5	

CLOSED PIPE	
Resonance	Frequency
1	
2	
3	
4	
5	

STEP 5: REMARKS:

Comments and Conclusions.