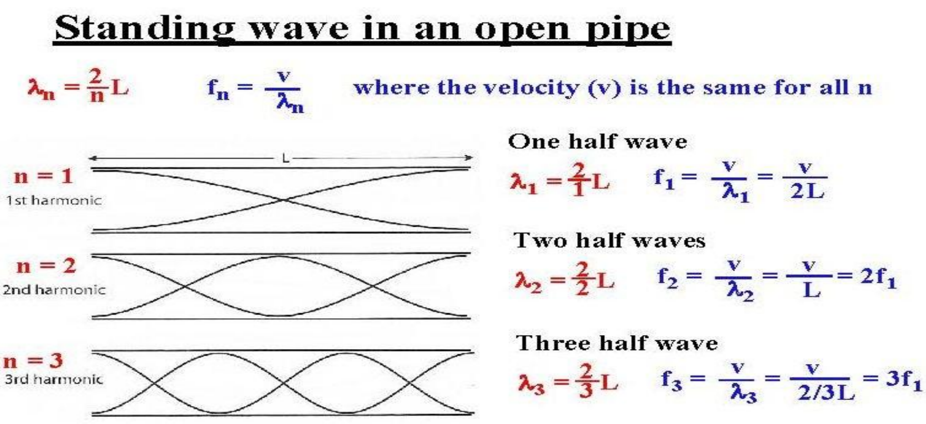
Q- The fundamental frequency of an open-open tube is 1500 Hz, when it is filled with helium at 0°C. What is the frequency when it is field with air at 0°C?

As we know the c = f λ and for fundamental frequency the length of the open-open tube L is equal to half of the wavelength i.e. (λ/2) = L which is same for both the gases we get for air and helium



$$c_{He} = f_{He} * 2L$$

And $c_{air} = f_{air} * 2L$

Dividing the two equations we get

$$\frac{f_{He}}{f_{air}} = \frac{c_{He}}{c_{air}}$$

Now the speed of sound in air at 00C is 331 m/s and that for helium is 972 m/s (http://hyperphysics.phy-astr.gsu.edu/hbase/sound/souspe.html#c5)

Substituting in above equation we get

$$\frac{f_{He}}{1500} = \frac{972}{331}$$

Or $f_{He} = 1500 * \frac{972}{331} = 4405\ Hz$