b.) **Both Ends Open:**

$$v = f_n \lambda_n$$

$$f_n = n f_1 = n \frac{v}{2L}$$

$$\lambda_n = \frac{\lambda_1}{n} = \frac{2L}{n}$$

$$n = 1, 2, 3, 4 \ldots$$

Open Ends: $\Rightarrow$ **Pressure _nodes_** and **displacement _anti-nodes_** at $x = 0$ and $x = L$.
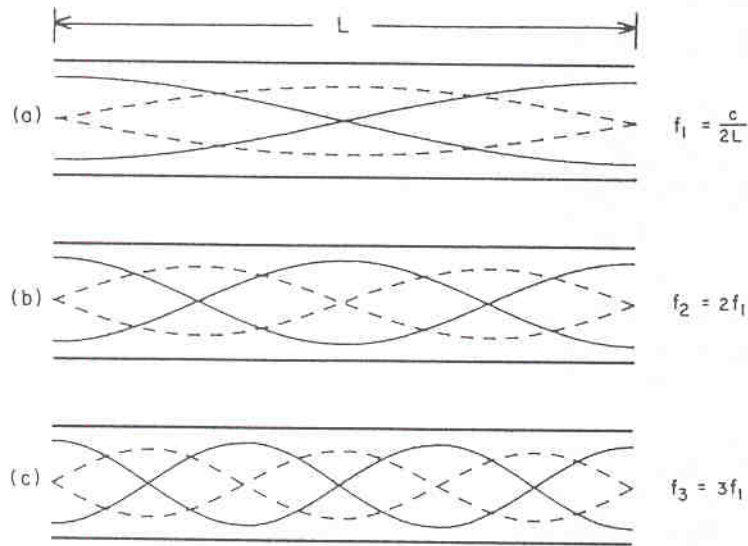

Fɪɢ. 8. First three vibration modes of an air column open at both ends. Solid lines give displacement amplitudes; dashed lines, pressure amplitudes.