Acoustics Assignment 3: Due 10/22

1. We are planning to digitize a recording and we need to be able to measure the first
    two formants of vowels produced by the speaker, who has a vocal tract of about 15
    cm in length. What is the minimum sampling rate that we could use, given the
    expected maximum F2 for this speaker? Assume a maximum constriction length of 4
    cm in calculating the expected maximum F2 for the speaker.

2. Sound waves reach the eardrum through the ear canal (or external auditory meatus).
    Given that the ear canal is a tube of about 2.5cm long, open at one end, what effect
    will it have on sound waves? (Be as precise as possible - i.e. use a simple calculation
    to estimate the effect).

3. What is the interval between spectral points (analysis components) in an FFT
    spectrum if the sampling rate is 11 kHz and the analysis window is 512 samples long?

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