DSP Homework 04

1. Write a summary of this week's video(s) and your further thoughts on the content.
2. When studying the sampling process, we use the function

$$s(t) = \begin{cases} 1, & \text{if } t = nT, \\ 0, & \text{otherwise.} \end{cases} \tag{1}$$

to express the sampling signal

$$\begin{aligned} x_s(t) &= x(t)s(t) && (2) \\ &= \begin{cases} x(nT), & \text{if } t = nT, \\ 0, & \text{otherwise.} \end{cases} && (3) \end{aligned}$$

It turns out that such approach is not useful when using the Fourier transform because

$$\tilde{s}(f) = \tilde{x}_s(f) = 0 \tag{4}$$

Prove (4).

3. Design and carry out an experiment to find out the highest and lowest audio frequencies that your left and right ears can hear.
4. Write a (improved) proposal for your first project.