1. I sampled a signal at a rate of 1 kHz. I then produced two spectrograms of the signals using a Hamming window and a rectangular window, both of length $L = 2^n$. The color scale is in dB.

![Spectrograms](image)

a) (2 pts) Which spectrogram was produced with a Hamming window? How can you tell?

b) (2 pts) What is the length of the window used?

2. Suppose I have white noise with variance $\sigma^2_x$ as an random variable input $X$ to an LTI system with impulse response resulting in an output random variable $Y$.

$$h[n] = \begin{cases} 
1, & n = 0 \\
2, & n = 1 \\
3, & n = 2 \\
0, & \text{otherwise}
\end{cases}$$

a) (2 pts) What is the mean of $Y$?

a) (2 pts) What is the cross correlation $\phi_{yx}$?

b) (2 pts) What is the autocorrelation $\phi_{yy}$?