1. What is hysteresis and how does it help prevent bad behavior on digital inputs?

Hysteresis changes the voltage threshold based on digital states, this helps to prevent bad behavior on digital inputs because it helps the system be less sensitive to noise and fluctuations giving more accurate inputs.

1. What is quantization?

Quantization is the mapping of a high resolution analog signal into a lower resolution representation. This is done by diving its range into intervals simplifying the signal while persevering the most important aspects.

1. What does Nyquist theory explain? What is the problem with sampling a signal too slowly?

Nyquist theory states that in order to represent an input signal by sampling its value periodically, the sampling rate MUST be at least twice the frequency of the fastest signal. The problem with sampling a signal too slowly is that you’ll either not be able to recognize the output at all, or you will have higher-frequency signals aliasing, and falsely appearing as slower ones

1. The maximum resolution of the ADC is 12-bits. How many quantization steps/values does this give us?

It would give us 4096 quantization steps/values, from 2^12.

1. What are the steps to perform an ADC calibration?
   1. Set the desired operating mode, data resolution, and trigger source.
   2. Stop the peripheral.
   3. Do not set any enable or start bits.
   4. Use the ADC\_CR register to allow the system to self-calibrate.
2. What’s the difference between right and left-aligned data in the DAC registers?

In DAC register left-aligned is used to select the upper bits of a 16 bit number while right-aligned data is used to select the lower bits.

1. What DAC register would you use to write 8-bit right-aligned data? (use the peripheral reference manual)

You would use the DAC\_DHR8R1 register to write the data.

1. Name something you found confusing or unclear in the lab manual. If everything was clear, simply answer that you didn’t have any issues.

Most of my issues during the labs come from implementation, but if I had to say what was the most confusing it would be ADC calibration and how it works. Not how to implement as there is a register that will auto calibrate but specifically how it works.