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

* Hysteresis is an improvement over using thresholds by changing the voltage threshold based on the current state of the signal. This means that when a signal is high, for example, the threshold to transition to a low signal drops lower to prevent “accidental” transitions.
* It helps prevents bad behavior by helping the circuit ignore unwanted ripples in voltage that might incorrectly be captured as a level change.

1. What is quantization?

* Quantization is the process of mapping a higher-resolution signal to a lower resolution one. In the case of an ADC, it is the conversion of a smooth waveform to one in which analog voltage levels are now represented by values within a certain bit width.

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

* Nyquist theory explains the relationship between sampling frequency and whether or not it’s possible to tell what the original signal was after the fact. The problem with sampling a signal too slowly is that additional fluctuations in the signal that may have occurred between samples will be missed entirely, resulting in a reconstructed waveform that is wholly inaccurate to reality.

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

this give us?

* 4096 steps

1. What are the steps to perform an ADC calibration?

* Ensure ADEN = 0 and DMAEN = 0
* Set ADCAL = 1
* Wait until ADCAL = 0
  + (calibration factor can be read from bits 6:0 of ADC\_DR)

1. What’s the difference between right and left-aligned data in the DAC registers?

* Left-aligned data in the DAC register is used for selecting the upper bits of a 16-bit number.
* Right aligned data simply loads data into the lower 8 bits of the register and is the “normal” mode of operation.

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

reference manual)

* DAC\_DHR8Rx[7:0]

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.

* Don’t have any issues