

1. What is hysteresis and how does it help prevent bad behavior on digital inputs?
  - Hysteresis changes the voltage threshold depending on the currently detected digital state. This makes it impossible for a signal to consistently hang around the trigger point.
2. What is quantization?
  - the process of mapping a high-resolution signal to a manageable lower-resolution one.
3. What does Nyquist theory explain? What is the problem with sampling a signal too slowly?
  - The relationship between how often you sample an input signal and whether or not you'll be able to tell what it is afterwards.
  - If the sampling rate is too slow/infrequent it won't be able to represent signals accurately
4. The maximum resolution of the ADC is 12-bits. How many quantization steps/values does this give us?
  - 4096 values
  - $2^8 = 256$
  - $2^{12} = 4096$
5. What are the steps to perform an ADC calibration?
  1. Ensure that ADEN = 0 and DMAEN = 0.
  2. Set ADCAL = 1.
  3. Wait until ADCAL = 0.
  4. The calibration factor can be read from bits 6:0 of ADC\_DR.
6. What's the difference between right and left-aligned data in the DAC registers?
  - The left-aligned mode is typically used for selecting the upper bits of a 16-bit number, allowing the DAC to act on 16-bit data without any conversion or shifting.
  - The right-aligned mode must be shifted or converted to allow the DAC to act on it.
7. What DAC register would you use to write 8-bit right-aligned data? (use the peripheral reference manual)
  - DAC\_DHR8Rx [7:0] bits
8. Name something you found confusing or unclear in the lab manual. If everything was clear, simply answer that you didn't have any issues
  - I didn't have any issues