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Lab#5 questions

**Question 1: Describe what happened to the relation of the input signal and the output signal. What is this phenomenon called?**

When the input signal is sampled lower than the nyquist frequency, the sampling can not keep us with the input signal. Oppositely, if the input signal is sampled higher than the nyquist frequency, the sampling captures the input signal. This phenomenon is called aliasing.

**Question 2: what is the PDB0\_MOD register, and what value will produce 120 Hz blink rate? How did you determine that value?**

The PDB0\_MOD register is the register contains the PDB module. In this register, bit 15:0 determine the period of counter. When the counter reaches the value in the register, the counter reset to 0.

For 1s(1Hz), the calculation is 1/(48 MHz / 128 / 10) \* 37500. If we want a value to produce 1/120s(120Hz), the value will be 37500/120 equals to 312.5.

**Question 3: At a sample rate of 10 kHz, how much time is available between each DMA interrupt for processing?**

1 to 2 milliseconds available between each DMA interrupt.

**Question 4: Why does the square wave show data in many bins?**

We generated the square wave by summing together many sine waves together at different frequency. The FFT plot displays the frequency components on the graph. So we see many frequencies of sine waves comprise the square wave.

**Question 5: How many FFTs per second can you display?**

We measured each FFT is displayed in every 10ms. So, in a second, there is 100 FFTs.