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

* As the frequency neared the nyquist frequency, the resolution of the wave looked to get worse and worse and looked more like a series of step changes rather than a smooth sine wave. After exceeding the nyquist frequency it was no longer able to recreate the original wave, the steps were so large it could appear as a different frequency than the original due to aliasing.

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

* PDB0\_MOD is a modulus register that is located in 0x40036004. It contains a value that operates the modulus such that when the counter reaches the value in the modulus register, it resets the counter value to 0. When PDB period has the value of 37500, which comes from 48 MHz / 128 / 10 / 1 Hz, the blink rate is 1Hz. If we divide 37500 by 120, which comes from 48 MHz / 128 / 10 / 120 Hz = 312.5, the blink rate should be 120Hz.

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

* Interval time between DMA interrupts was 1.7 milliseconds. It shows that 1.7milliseconds are available between DMA interrupts.

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

* The FFT function essentially tells you the amount of various frequencies of sine waves it takes to make a signal. A square wave is extremely far from an average sin wave and recreating a square wave with sin waves requires a large amount of different sin waves of different amplitudes and frequencies added together to create and as such there is data to reflect that in the appropriate bins.

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

* We could display 87 FFTs per second. We could calculate this count by utilizing the millis() function.