ECE250: Signals and Systems
Quiz6

1. **[CO3]Given that**
   x[n] and y[n] are periodic signals with period N having fundamental frequency $w_0 = 2\pi/N$. Also, the Fourier series coefficients a_k and b_k are periodic with period N.

   Prove that multiplication in the time domain is equal to convolution in the frequency domain for discrete-time periodic signals

   $$x[n]y[n] \leftrightharpoons \sum_{l=<N>} a_l b_{k-l}$$

   The right-hand side expression is called periodic convolution because the summation is over only N successive points. The result will repeat periodically after that.