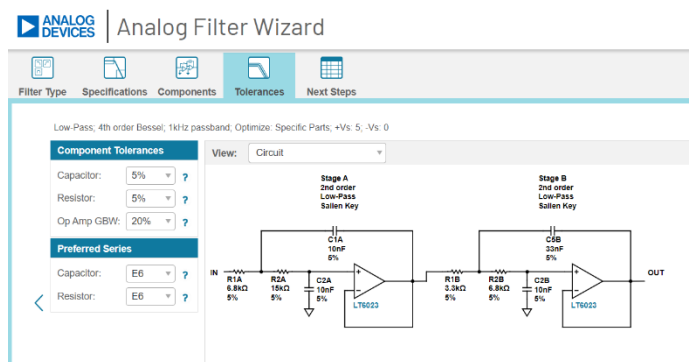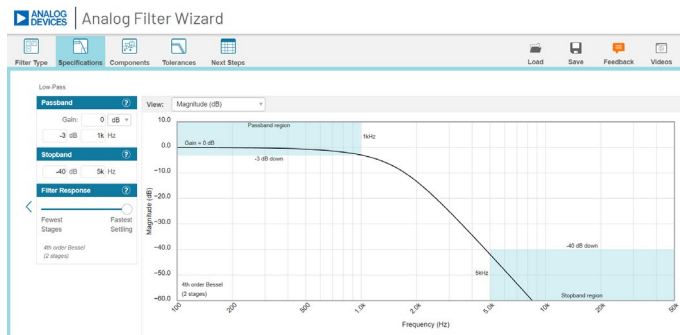### Step 1: Use Analog Devices Filter Wizard to design the plant
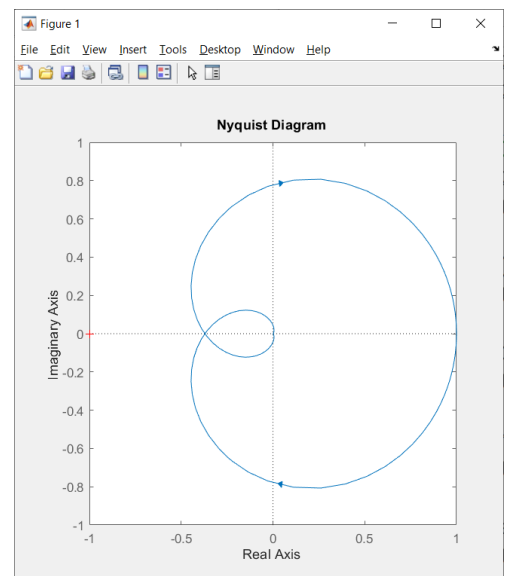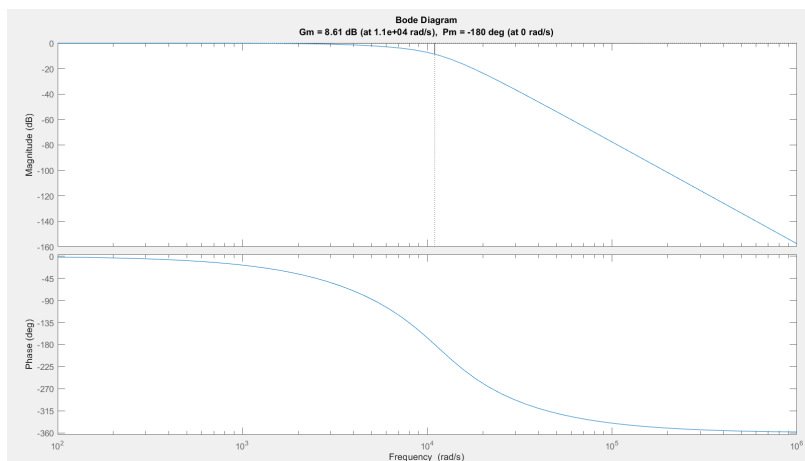

Step: Use Excel to convert the component values into the transfer function for each section.

G1 =

$$\frac{9.803e07}{s^2 + 2.139e04\ s + 9.803e07}$$

G2 =

$$\frac{1.35e08}{s^2 + 1.371e04\ s + 1.35e08}$$

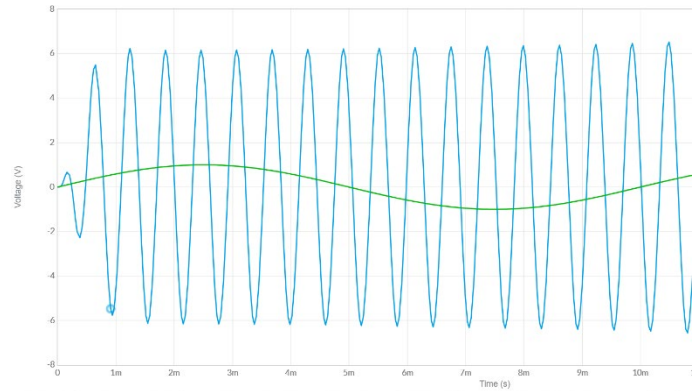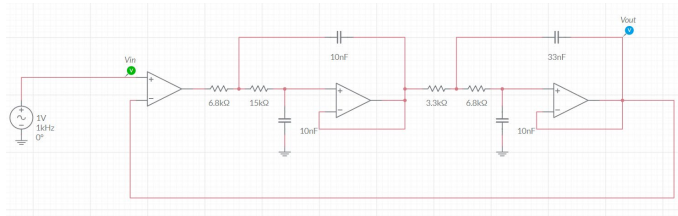### Step 3: Use Matlab to examine the open-loop behavior

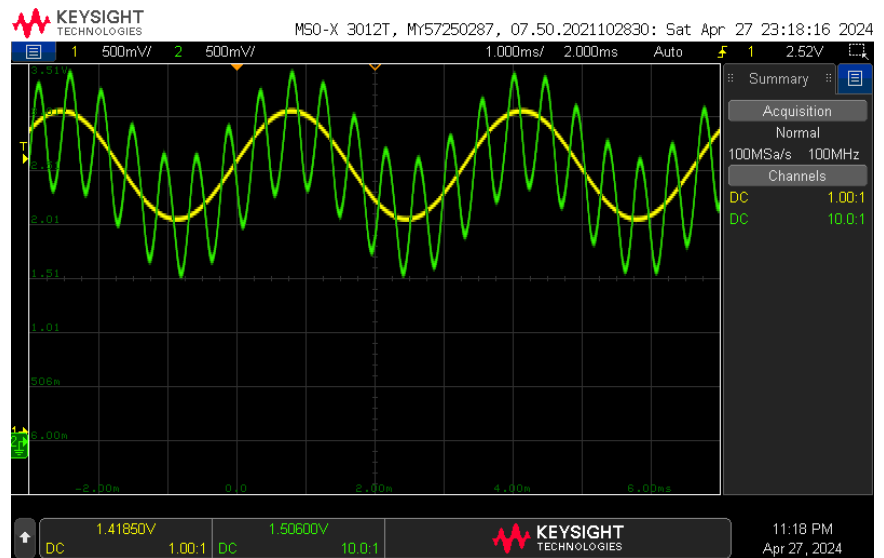margin(G1*G2)   nyquist(G1*G2)

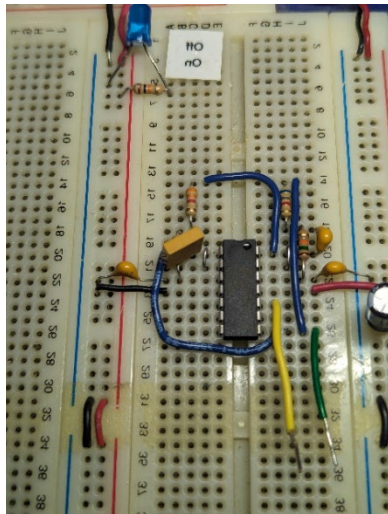With a gain margin, we can scale G1*G2 by 10^(8.61/20) = 2.7 before the closed loop goes unstable.

Step 4: Use ModelSim to examine the closed loop behavior.

Step 5: Check that this is not a problem with the simulator.

Step 6: Hypothesize, research, explain.