Lab 6 Post-lab

1. Enter the data from Experiment I in the following table.

$Freq(Hz)$	V_{acc}	V_{in}	$Freq(Hz)$	V_{acc}	V_{in}
1	5	100	15	8.8	100
2	5	100	16	12	100
3	**21**	**100**	17	18	100
4	5.6	100	**18**	**62.5**	**100**
5	5.6	100	19	42	100
6	5	100	20	20	100
7	5	100	25	10.6	100
8	5	100	30	10	100
9	5	100	35	10.6	100
10	5.6	100	40	15	100
11	6.3	100	45	27	100
12	6.3	100	**50**	**153**	**100**
13	6.9	100	55	46.3	100
14	7.5	100	60	26.9	100

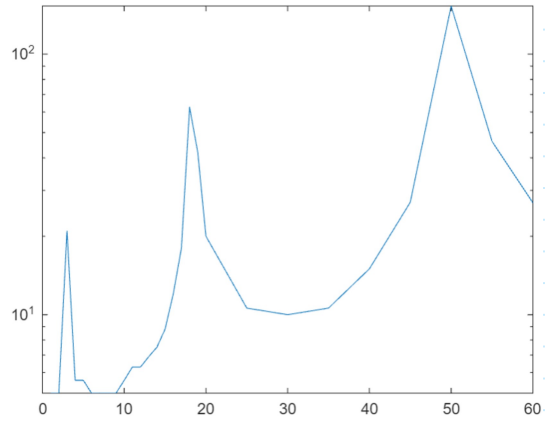
2. Record the first three natural frequencies within 0.1 Hz, as well as the corresponding peak-to-peak accelerator voltage.

$\omega_1 = 3 \cdot 2\pi$ $V_{acc} = 21$

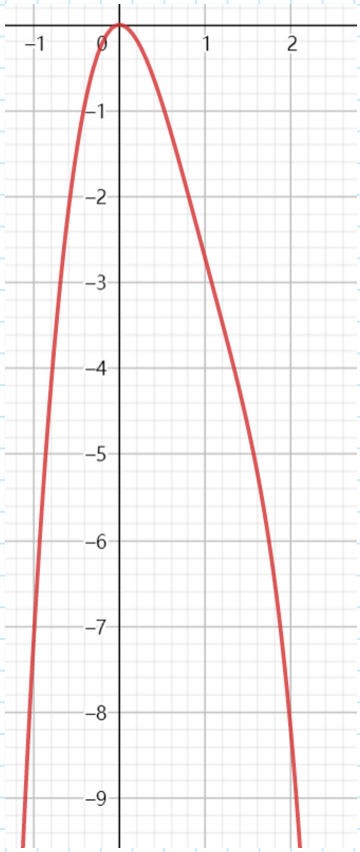
$\omega_2 = 18.4 \cdot 2\pi$ $V_{acc} = 158.8$

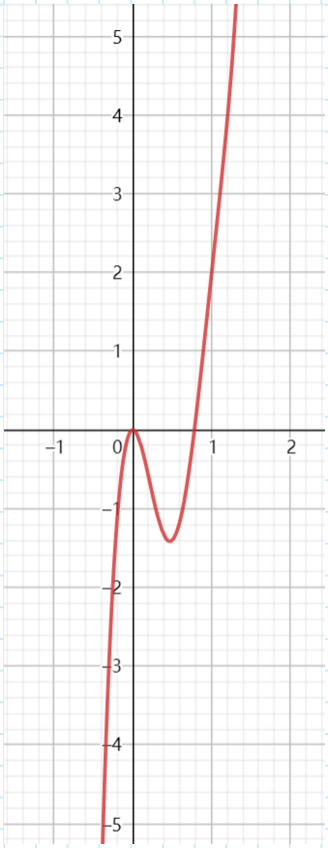
$\omega_3 = 50.9 \cdot 2\pi$ $V_{acc} = 158.8$

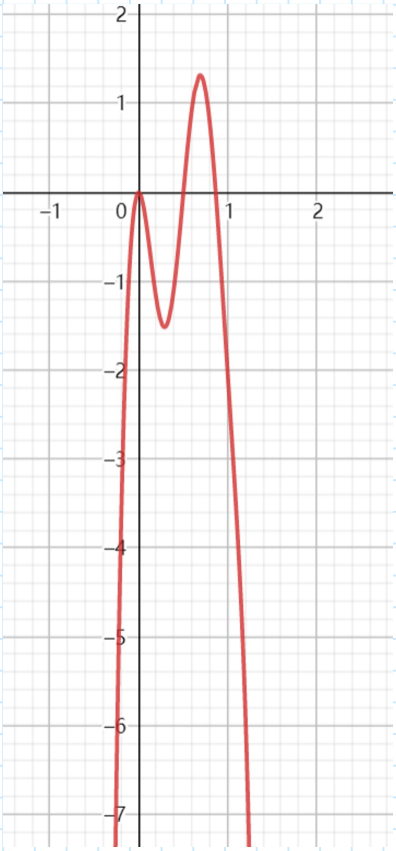
3. Attach the Bode diagram of the magnitude of the beam's frequency response function.



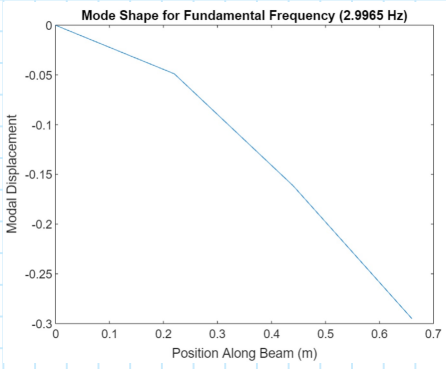
4. Attach a sketch of the first three mode shapes of the beam.

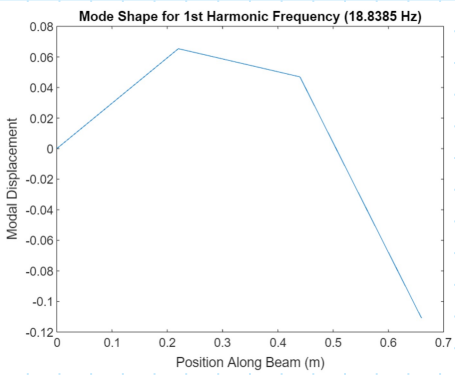


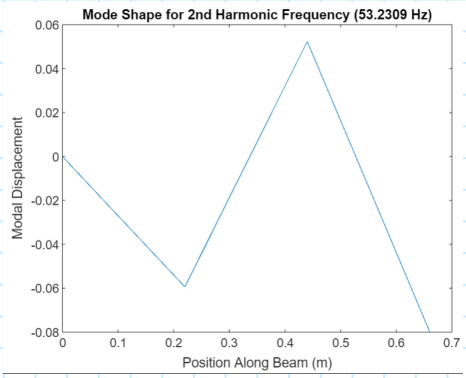




5. Attach the three plots generated by running the FEA in MATLAB.







6. Compare the FEA mode shapes to the sketched experimental mode shapes. Do the shapes roughly match? What could be done to make the FEA mode shapes more like what you saw in the experiment?

Yes. They roughly match.

I think we can make the mesh size in FEA finer so that the graphs have higher resolution