Question 1 (80 points)

Use the instant-centre method and design a Displacement-amplifying Compliant Mechanism (DaCM) that fits within a square of 20 cm × 20 cm with thickness equal to 2 cm. There should be a purpose of the mechanism (gripping, clamping, sensing, etc.). The following steps should be followed.

1. Intuitive graphical design to get as large an amplification as possible for interesting input and output degrees of freedom.
2. Analyze your DaCM using linear and nonlinear beam codes in Matlab.
3. Create a continuum model of your mechanism in COMSOL and analyze it there to see deformed profile and stress profile.
4. Use TA's help to make prototype using CNC milling of polypropylene sheet.

What to submit:

a. All details as a report (a paper copy)
b. Input files for Matlab beam code (by email)
c. COMSOL file (by email)
d. The prototype you made