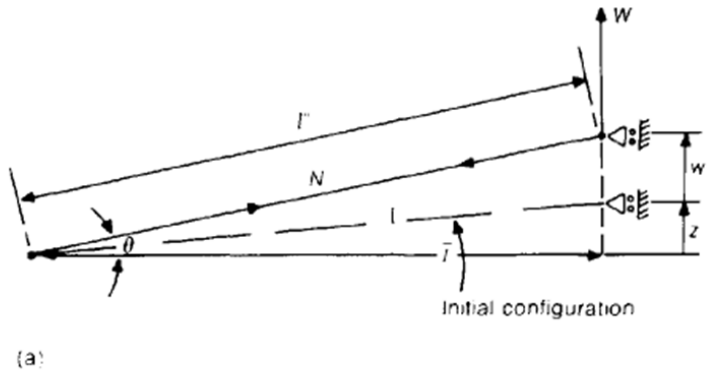
# CE 810 Homework 2

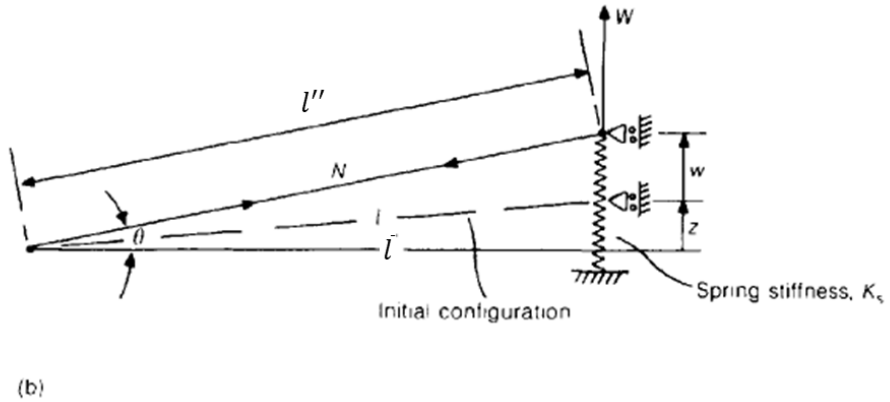
Due by the start of class on Wed. 9/10

1. For the 1-DOF system in Figure (a), plot the normalized load-deflection relationship (see the class notes for the way of normalization of W and w) using Python. Assume the right end of the bar moves downward. (10pt)
2. For the 1-DOF system in Figure (b) and $K_s = \frac{EAz^2}{2l^3}$, plot the normalized load-deflection relationship (see the class notes for the way of normalization of W and w) using Python. Assume the right end of the bar moves downward. (10pt)
3. Write a Python program to obtain an incremental solution for the system in Figure (b) using a incremental load of -7 *N* until the force W is -91 *N*. On the same plot (-W vs. -w), compare the numerical solution with the "exact" solution given in class. Use the following dimensions and properties:
   $EA = 5 \times 10^7 N, z = 25mm, l = 2500mm, K_s = 1.35N/mm$ (30pt)
4. Solve Problem 3 using an incremental-iterative solution procedure. For convergence test, use a tolerance of 1e-4 for the unbalanced force. (50pt)

To submit your codes, please "Fork" the GitHub repo xinlong-du/CE810Stability, clone it to your local computer, work in the folder with your name, and use "Pull request" to submit your work before the due time.




(a)




(b)

Figure for Problems 1 to 4 (cross-sectional area=A, Young's modulus=E).