4A. Find the minimum dimensions of a column with a rectangular cross-section (h by b) where h = 3b and with the following properties.
   a. Length = 20 inches
   b. $P_{cr} = 60,000$ lb
   c. $E = 30,000,000$ psi
   d. $\sigma_{yp} = 45,000$ psi
   e. $C = 1.2$

4B. A column has the closed box cross-section shown below. This column has been produced by extruding 7075-T6 aluminum alloy. The dimensions shown below are centerline dimensions and the wall thickness is the same for all panels. The column has the properties listed below
   a. Length = 40 inches
   b. Young’s modulus = 10,000,000 psi
   c. $\sigma_{yp} = 35,000$ psi
   d. $C = 1.2$

1. Calculate $P_{cr}$ assuming that the column will fail via crippling.
2. Calculate $P_{cr}$ assuming that the column will fail via global buckling
3. Will the column fail via crippling or global buckling?
4B. A column has the “T” cross-section shown below. This column has been produced by extruding 2024-T3 aluminum alloy. The dimensions shown below are centerline dimensions and the wall thickness is the same for all panels. The column has the properties listed below:
   a. Length = 40 inches
   b. Young’s modulus = 10,000,000 psi
   c. $\sigma_{yp} = 25,000$ psi
   d. $C = 1.2$
   e. Wall thickness is 0.0375 inch for flange and web

1. Calculate $P_{cr}$ assuming that the column will fail via crippling.
2. Calculate $P_{cr}$ assuming that the column will fail via global buckling
3. Will the column fail via crippling or global buckling?