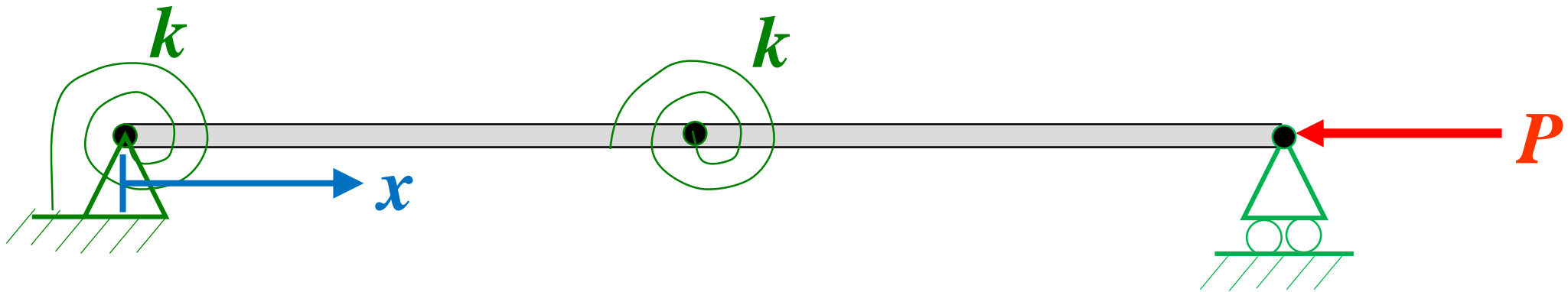# Problems 2

Consider two rigid rods, each of length l, simply supported at $x = 0$ and $2l$. At and connecting the rods there under rotational springs of elastic constant k. The rods are under a compressive load P as depicted in the figure. Compute the buckling load for the rods.

Consider the simply supported beam of length $2l$ with the geometry and properties depicted in the figure. The beam is under a compressive load. The beam is pinned with another beam of length l at the its center. The other end of this beam is clamped. Assemble a finite element model for the system.


x

EI, EA

P

l

l

l

EI, EA
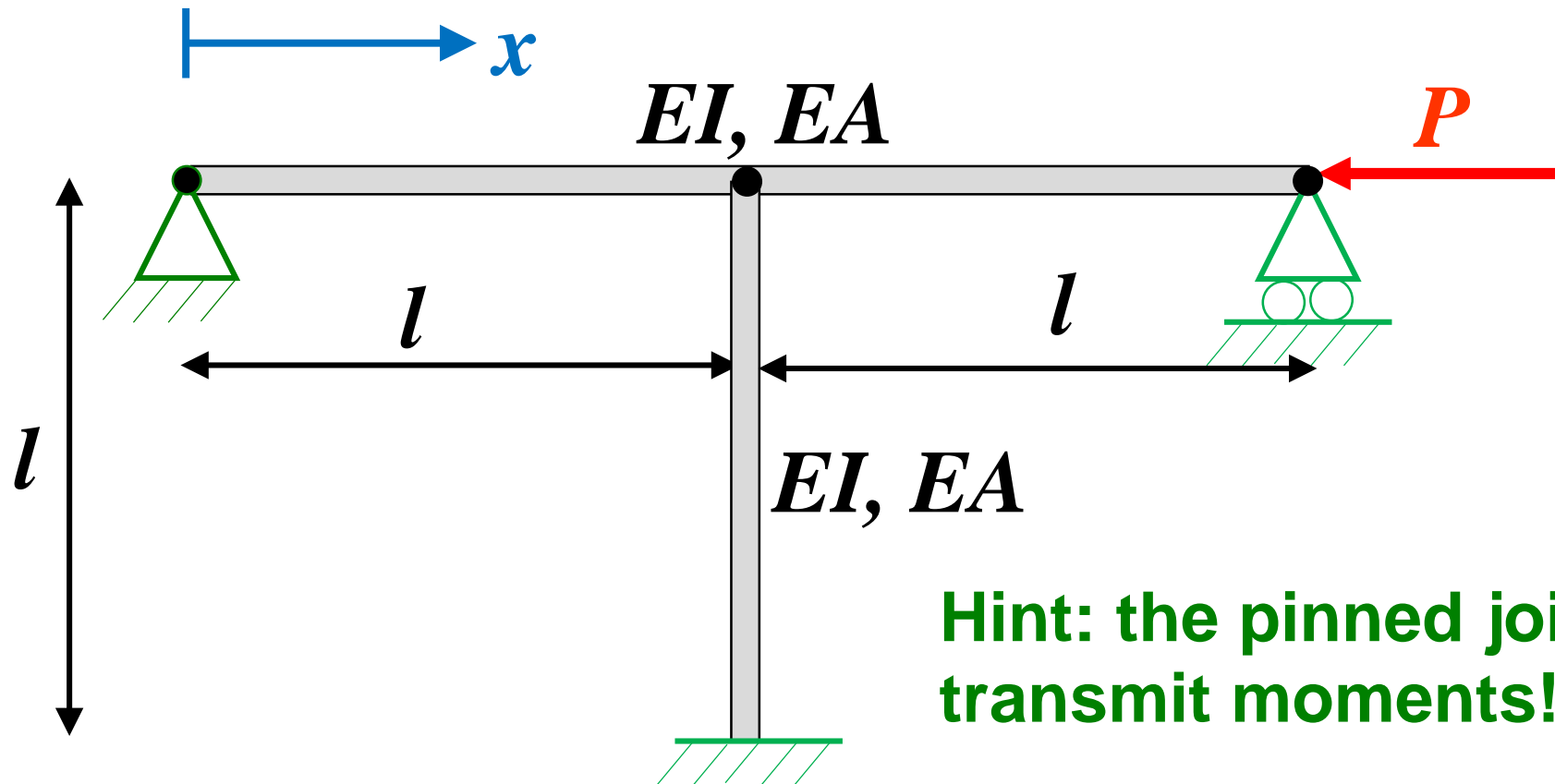
Hint: the pinned joint does not transmit moments!

Consider the frame depicted in the figure. The geometry, material properties, and boundary conditions are indicated in the figure. The identical beams are rigidly connected. Assemble a finite element model for computing the buckling load.
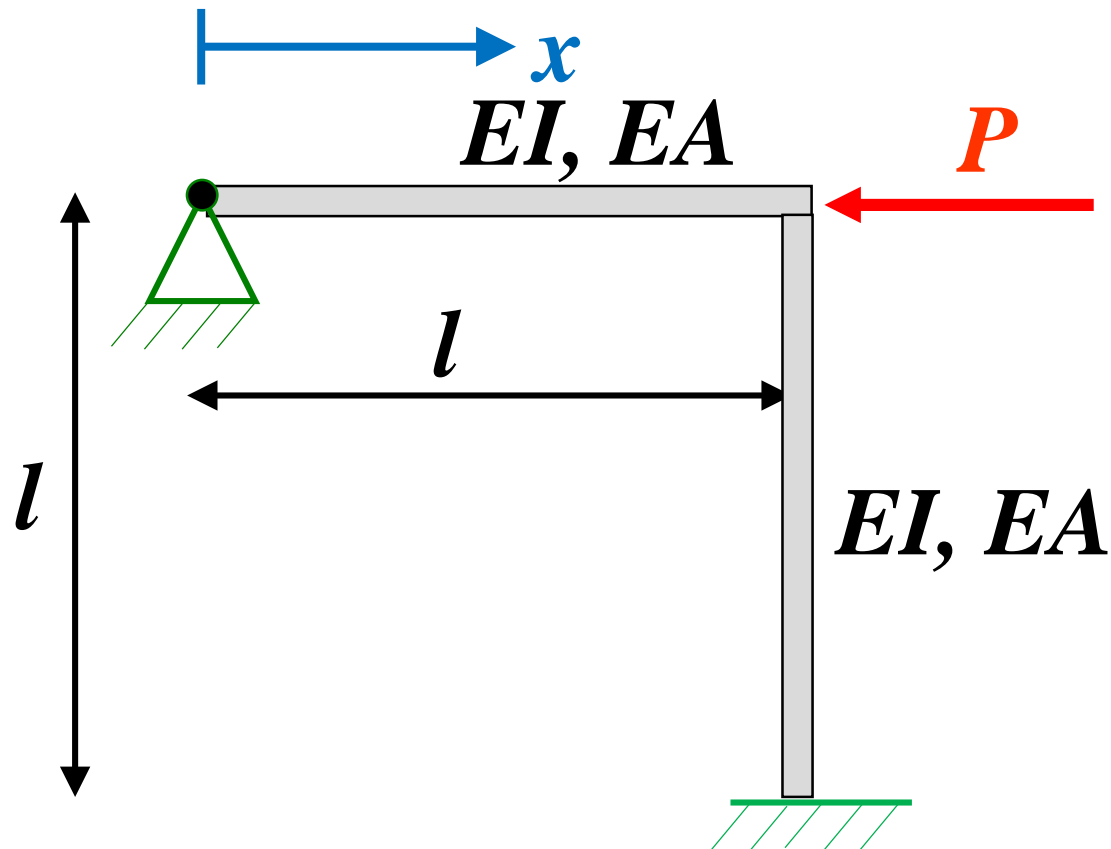
Two identical clamed beam are pinned to a rigid bar as depicted in the figure. Assemble a finite element model to compute the buckling mode of the structure.
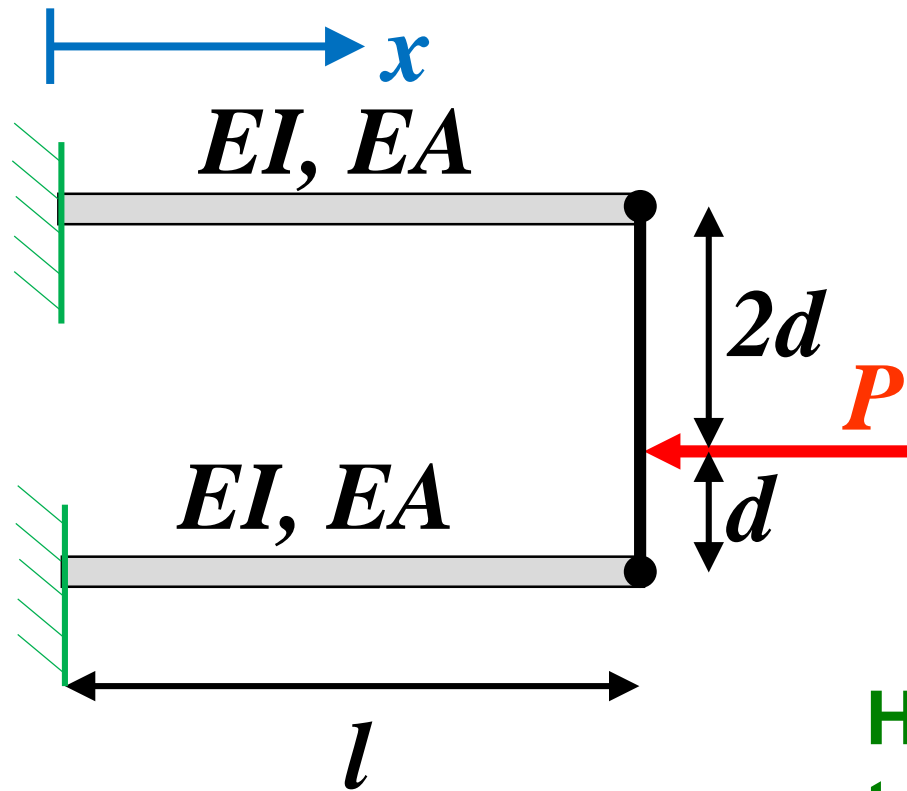
Hint: the pinned joint does not transmit moments!

A square simply supported plate is subjected to bi-axial compressive loads such that $N_x/N_y = 2$. Compute the buckling load assuming that the plate bending stiffness is D.