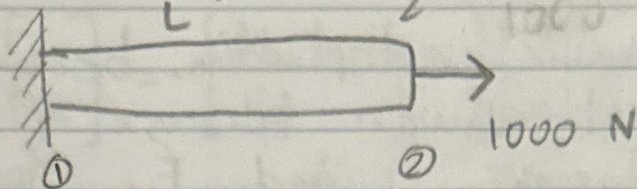


$$E = 200 \cdot 10^9$$

$$A = 0.01$$

$$L = 2$$

$$\frac{EA}{L} = \frac{200 \cdot 10^9 \cdot 0.01}{2} = 1 \cdot 10^9$$



$$k = \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix} E = \begin{bmatrix} 1 \cdot 10^9 & -1 \cdot 10^9 \\ -1 \cdot 10^9 & 1 \cdot 10^9 \end{bmatrix}$$

$$f = \begin{bmatrix} f_1 \\ 1000 \end{bmatrix}$$

$$u = \begin{bmatrix} 0 \\ u_2 \end{bmatrix}$$

$$\begin{bmatrix} f_1 \\ 1000 \end{bmatrix} = \begin{bmatrix} 1 \cdot 10^9 & -1 \cdot 10^9 \\ -1 \cdot 10^9 & 1 \cdot 10^9 \end{bmatrix} \begin{bmatrix} 0 \\ u_2 \end{bmatrix}$$

Implement boundary conditions

$$\begin{bmatrix} 0 \\ 1000 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \cdot 10^9 \end{bmatrix} \cdot \begin{bmatrix} 0 \\ u_2 \end{bmatrix}$$

Solve for u_2

$$1000 = 10^9 u_2$$

$$u_2 = 1 \cdot 10^{-6} \text{ m}$$

Solve for f_1 .

$$f_1 = 10^9 \cdot 0 + (-10^9)(1 \cdot 10^{-6}) = -1000 \text{ N}$$