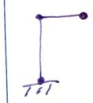
In each matrix box write the size of the matrix (in terms of N when appropriate), what each of the rows & columns represents and the formulas that go in that matrix or (in the case of a matrix of 0 and 1) how you decide what to put in each space in the matrix

N = Number of Nodes in the system, D = Number of Degrees of Freedom at each node

		Coord Sys:	local		Global		Global	Boundary				Solving for...		
		Form:	element		element	Placement Matrix [Place] [Trans]^T	system	Condition Matrix [BC]	Force Matrix {F}	Apply BCs [K]_R {F}_R	Solution Form:	Disp.	Stresses	Rxn Forces
Case	Representative Picture	# DOF (@ node)	stiffness matrix, [k]	Transformation Matrix [T]	Stiffness matrix $[K]^N$		Stiffness Matrix $[K]^G$							
Axial		Number: 1	Size: 2x2	Size: 2x2	Size: 2x2	Size: (N·D)x2	Size: (N·D)x(N·D)	Size: (N·D)x(N·D - # constrained)	Size: (N·D)x1	Size:	Size:	Location: Node	Location: element	Location: node
		Direction(s):	Content: $\frac{AE}{L}\begin{bmatrix}1 & -1\\ -1 & 1\end{bmatrix}$ ← k or $\begin{bmatrix}k & -k\\ -k & k\end{bmatrix}$	Content: Identity Matrix — or — n/a b/c all in line	Equation & Content: same as local element stiffness b/c all in a line	Content: $i_x\ i_y$ 1 when they intersect 0 every where; $1_x\ 2_x\ 3_x \dots$	Equation & Content: $[K]^G=[Place][K]^N[Place]^T$ $[K]^G=[K]^{G1}+[K]^{G2}+\dots$	Content: $1_x\ 2_x \dots$ Remove cols w/ no DOF (i.e. Constrained) $1_x\ 2_x\ 3_x \dots$	Content: $\{F\}=\begin{Bmatrix}1_x\\ 2_x\\ \vdots\end{Bmatrix}$	Content: $[K]^G_R=[BC]^T[K]^G[BC]$ $\{F\}_R=[BC]^T\{F\}$	Content: $\{U\}_R=([K]^G_R)^{-1}\{F\}_R$ ↑ Global system $\{U\}=[Place]\{U\}$ ↑ element	Equation: $\{U\}=[BC]\{U\}_R$ $\sigma=E\frac{u_j-u_i}{L}$	Equation: $\{R\}=[K]^N\{U\}-\{F\}$
Truss 2D		Number: 2	Size: 4x4	Size: 4x4	Size: 4x4	Size:	Size:	Size:	Size:	Size:	Size:	Location:	Location:	Location:
		Direction(s):	Content: $\begin{bmatrix}k & 0 & -k & 0\\ 0 & 0 & 0 & 0\\ -k & 0 & k & 0\\ 0 & 0 & 0 & 0\end{bmatrix}$ $u_{ix}\ u_{iy}\ u_{jx}\ u_{jy}$	Content: $\begin{bmatrix}\cos\theta & -\sin\theta & 0 & 0\\ \sin\theta & \cos\theta & 0 & 0\\ 0 & 0 & \cos\theta & -\sin\theta\\ 0 & 0 & \sin\theta & \cos\theta\end{bmatrix}$ $u_{ix}\ u_{iy}\ u_{jx}\ u_{jy}$	Equation & Content: $[K]=[T][k][T]^T$	Content:	Equation & Content:	Content:	Content:	Content:	Content:	Equation:	Equation:	Equation:
Truss 3D		Number: 3	Size:	Size:	Size:	Size:	Size:	Size:	Size:	Size:	Size:	Location:	Location:	Location:
		Direction(s):	Content:	Content:	Equation & Content:	Content:	Equation & Content:	Content:	Content:	Content:	Content:	Equation:	Equation:	Equation:
Beam		Number: 2	Size:	Size:	Size:	Size:	Size:	Size:	Size:	Size:	Size:	Location:	Location:	Location:
		Direction(s):	Content:	Content:	Equation & Content:	Content:	Equation & Content:	Content:	Content:	Content:	Content:	Equation:	Equation:	Equation:
Frame		Number: 3	Size:	Size:	Size:	Size:	Size:	Size:	Size:	Size:	Size:	Location:	Location:	Location:
		Direction(s):	Content:	Content:	Equation & Content:	Content:	Equation & Content:	Content:	Content:	Content:	Content:	Equation:	Equation:	Equation:

General

(N·D)x2