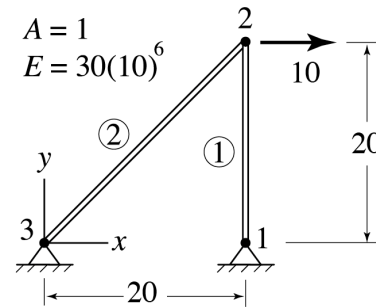


A Few Comments in Input Data for a FE Model

Consider the data needed to model the simple truss we analyzed in lecture (3 nodes, 2 dof per node, 2 elements, 2 nodes per element, 2 space dimensions, and 1 material set).

BAR	TEST	PROGRAM				
3	2	2	2	2	1	
1	11			20.	0.	
				0.	0.	
2	00			20.	20.	
				+10.	0.	
3	11			0.	0.	
				0.	0.	
1	1	2	1			
2	1	3	2			
1		1.	30.E06			



- 1st line: A short description of the model to be analyzed.
- 2nd line: Control information, specifying: # of nodes, # of dof per node, # of elements, # of nodes per element, # of space dimensions, and # of material sets*.
- 3rd and 4th lines: Data for the first node, specifying: the node number, the node's support conditions (0 designates a free dof and 1 designates a dof that has a prescribed zero value), the node's coordinates, and the node's loading.
- 5th-8th line: Data for nodes 2 and 3.
- 9th line: Data for the first element, specifying: the element number, the material set number, the global node number corresponding to generic node 1, and the global node number corresponding to generic node 2.
- 10th line: Data for element 2.
- 11th line: Material data, specifying: the material set number, cross sectional area, elastic modulus.

* If you are writing a program expressly for bars in 2-D, then it is not necessary to supply the # of dof per element (it's always 2), or the number of space dimensions (it's always 2).

Comments

- With some minor exceptions, the above is really the only input information that any finite element code needs.
- From this data, other parameters such the length of an element, its orientation angle, and the cosine and sine of its orientation angle, etc., can be calculated.
- A common error that new programmers make is to over specify the input information (e.g., it is not necessary, and in fact is a bad idea, to input parameters like element length, orientation angle, etc.). Anything that can be calculated from basic input data should be determined that way.