

S.N.	PROGRAM CODE	COMMENTS
1	clc	<p>Note:</p> <ol style="list-style-type: none"> 1. Important variables that store information for pre-processing and those that store results for post-processing will be introduced in the beginning. Other variables, of lesser importance, used in the program will be explained as and when it is observed. 2. It is assumed that reader is conversed with the symbols used in the theoretical formulation produced here in the earlier section. <p>Variable information:</p> <p>K : Global stiffness matrix (Input 1) P : Load vector (Input 2) nn : Number of nodes (Input 3) ne : Number of elements (Input 4) loc : Boundary location matrix (Input 5) bc : Boundary value matrix (Input 6) KM : Modified global stiffness matrix (Output 1) PM : Modified global force matrix (Output 2)</p> <p>(Line 1-2): It clears the <i>command window</i>¹ screen and clears the <i>workspace</i>² of all its historical contents.</p> <p>(Line 3-6): Assign the global stiffness matrix to variable K without applying boundary conditions. [INPUT 1]</p> <p>(Line 7): Assign global force matrix to variable P without applying boundary conditions. [INPUT 2]</p> <p>(Line 9-10): Displays global stiffness matrix K and global force matrix P without applying boundary conditions.</p> <p>(Line 11-12): Assign number of nodes and number of elements to variable nn and ne respectively. [INPUT 3,4]</p> <p>(Line 13-14): Assign node number of boundary conditions to be specified in column form in variable loc and assign the boundary values to variable bc corresponding to loc matrix. [INPUT 5,6]</p> <p>(Line 15-26): The for loop runs c times corresponding</p>
2	clear	
3	K=[5.5 -4.6 0 0 0;-4.6 14 -4.6 0 0;...	
4	.4 -4.6 11 -4.6 .4; 0 0 -4.6 14.2 -	
5	4.6;...	
6	0 0 4.0 -4.6 6.5];	
7	P=[50 200 100 200 90];	
9	K	
10	P	
11	nn=5;	
12	ne=4;	
13	loc=[1 5]';	
14	bc=[15 4]';	
15	c=length(bc);	
16	for i=1:c	
17	aa=K(loc(i),loc(i));	
18	P(loc(i))=aa*bc(i);	
19	for j=1:nn	
20	if j==loc(i)	
21	K(loc(i),j)=K(loc(i),j);	
22	else	
23	K(loc(i),j)=0;	
24	end	
25	end	
26	end	
27	for i=1:c	
28	for j=1:nn	
29	if j~=loc(i)	
30	sum(j)=K(j,loc(i))*bc(i);	
31	P(j)=P(j)-sum(j);	
32	K(j,loc(i))=0	
33	else	
34	end	
35	end	
36	end	
37	KM	
38	PM=P'	
39	U=inv(KM)*PM	

	<p>to the number of boundary conditions to be specified. This is step one of the manipulation. If U_i and U_j are known boundary conditions then set row i and j equal to zero except K_{ii} and K_{jj}. At the same, corresponding row i and j of global force matrix is replaced by $K_{ii} * U_i$ and $K_{jj} * U_j$ respectively.</p> <p>(Line 27-36): The for loop runs c times corresponding to the number of boundary conditions to be specified. Initially replace global force matrix such that $P(:, i) = P(:, i) - K(:, i) * U_i - K(:, j) * U_j$ except $P(i,1)$ and $P(j,1)$. U_i Corresponds to the displacement at node i. Then set column i and j equal to zero except K_{ii} and K_{jj}.</p> <p>(Line 37-38): Displays modified global stiffness matrix and global force matrix. [OUTPUT 1,2]</p> <p>(Line 39): Displays displacements.</p>
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Terms:

1. Command window:
2. Editor:
3. Workspace: