S.N.	PROGRAM CODE	COMMENTS

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9
	clc
	clear
	
	nn=5;
	ne=4;
	
	K(nn,nn)=0;
	
	nc=[1 2; 2 3; 3 4; 4 5]
	
	k=[100 100 100 100]'
	
	P=[0 0 -20 -30 30]'
		Note:
		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.
		
		Variable information:
		nn : Number of nodes
		ne : Number of elements
		K : Global stiffness matrix
		k : Local stiffness matrix
		P : Load matrix
		nc : Nodal matrix
		
		(Line 1-2): It clears the *command window*[1] screen and clears the *workspace*[2] of all its historical contents.
		
		(Line 3-4): In the present problem, the total number of elements in the structural system is four and the total number of nodes is five. This is assigned manually to **nn** and **ne** accordingly.
		
		(Line 5): Global stiffness matrix **K** is initialized or the size is pre-allocated with zeros. This step is introduced for computation efficiency because dynamic allocation during loops will require more computational resource.
		
		(Line 6): Nodal matrix **nc** is assigned manually. Each row in the **nc** matrix have two values that corresponds to the start and end nodal values of each element.
		
		(Line 7): Each value in the matrix **k** corresponds to the local stiffness of each element. It should be noted that it shall be input in the same order as **nc** matrix and in column form.
		
		(Line 8): Each value in the matrix **P** corresponds to the local force at each node. It should be noted that it shall be input in the same order as **nc** matrix and in column form.

```
10  for e=1:ne
11      i=nc(e,1);
12      j=nc(e,2);
13      p=[i,j]';
14      q=p;
15      ks=k(e)*[1 -1;-1 1];
16      c=length(p);
17      for l=1:c
18         for m=1:c
19          K(p(l),q(m))=ks(l,m)+K(p(l),q(m))
20         end
21      end
22  end
23
24  K
25  P
```

(Line 10-22): Figure 1.2 shows a loop diagram for the code. Line 10 it initiates the global assembly process of the local stiffness in the loop from Line 10 to Line 22.

Variable **`i`** and **`j`** stores the beginning and ending node numbers corresponding to the element number **`e`** in each loop L1.

Terms:

1. Command window:

2. Editor:

3. Workspace: