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 (*Input 1*)
		ne : Number of elements (*Input 2*)
		nc : Nodal vector (*Input 3*)
		k : Stiffness column vector (*Input 4*)
		P : Load vector (*Input 5*)
		K : Global stiffness matrix (Output 1)
		ks : Local stiffness 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.**[INPUT 1,2]**
		
		(Line 5): Global stiffness matrix **K** is initialized or the size is pre-allocated with zeros. This step is introduced for computational efficiency because dynamic allocation during loops will require more computational resource.
		
		(Line 6): Nodal vector **nc** is assigned manually. Each row in the **nc** vector have two values that corresponds to the start and end nodal values of each element. **[INPUT 3]**
		
		(Line 7): Each value in the vector **k** corresponds to the stiffness of each element. Do not mistake this with local stiffness matrix of each element. It shall be explained below. It should be also noted that is shall be input in the same order as **nc** vector and in column form. **[INPUT 4]**

```
10  for e=1:ne
11      i=nc(e,1);
12      j=nc(e,2);
13      ks=k(e)*[1 -1;-1 1];
14
15      K(i,i)=ks(1,1)+K(i,i);
16      K(i,j)=ks(1,2)+K(i,j);
17      K(j,i)=ks(2,1)+K(j,i);
18      K(j,j)=ks(2,2)+K(j,j);
19  end
20
21  K
22  P
```

(Line 8): Each value in the vector **P** corresponds to the local force at each node. It should be noted that it shall be input in the same order as **nc** vector and in column form. **[INPUT 5]**

(Line 10-19): Line 10 initiates the global assembly process of the local stiffness in the loop from Line 10 to Line 22 from the local stiffness matrices.

(Line 21): Displays global stiffness matrix **[OUTPUT 1]**