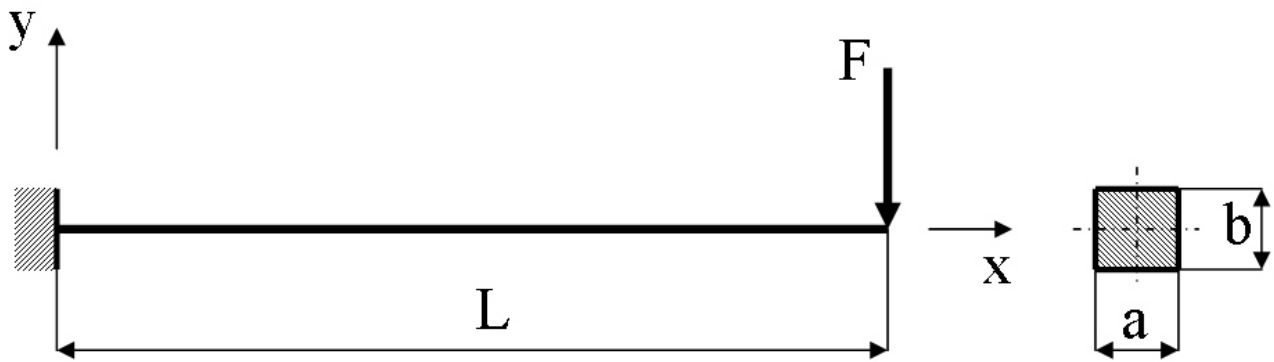
Course in ANSYS

Example0101

Example – Cantilever beam



Objective:
Display the moment curve
Tasks:
Obtain values in intermediate points?
Create an element table?
Display the moment curve?
Topics:
Start of analysis, Element table/output, intermediate points, saving/restoring

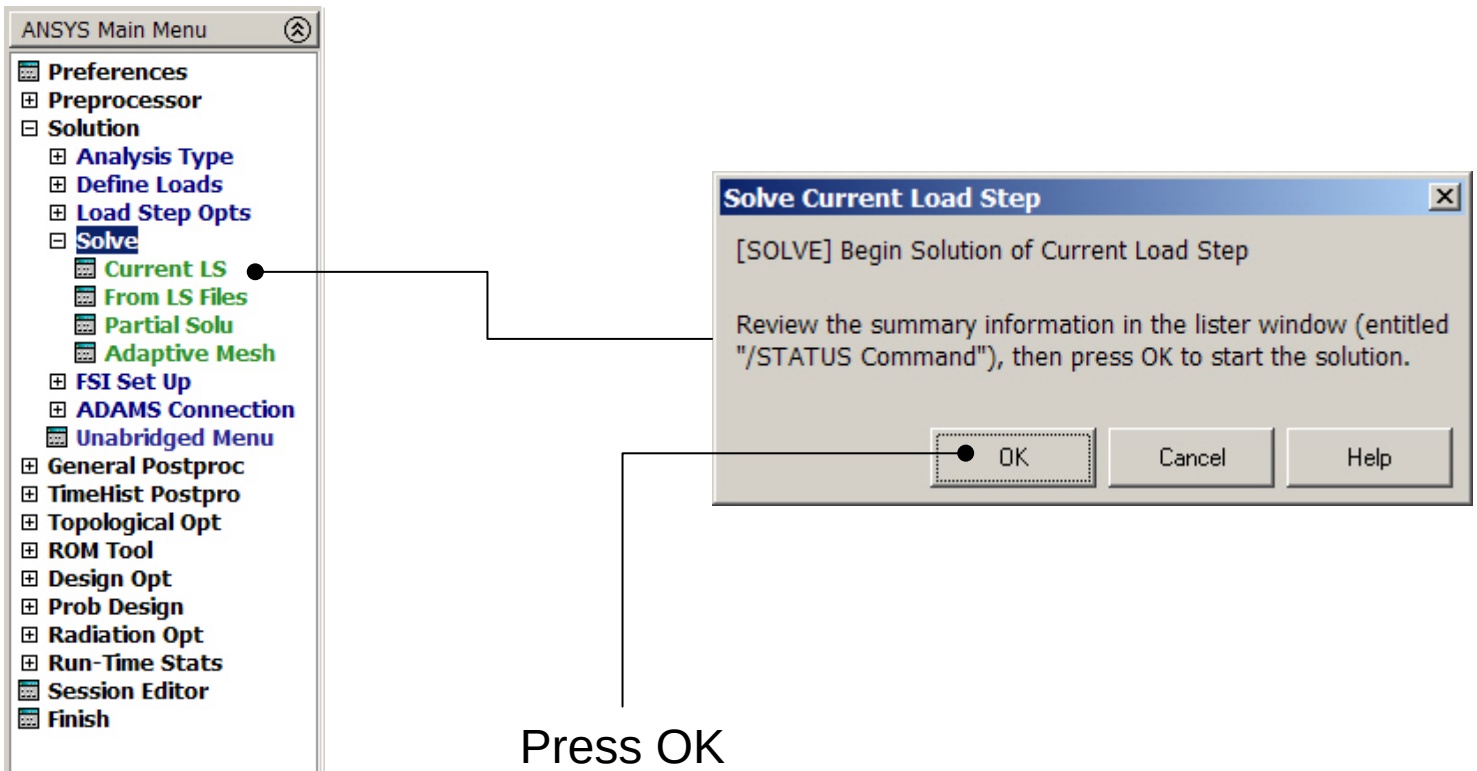
$E = 210000 N/mm^2$
$\nu = 0.3$
$L = 100mm$
$a = 10mm$
$b = 10mm$
$F = 100N$

Example – Read input from

Load the example0100.lgw by **File Menu > Read input from**

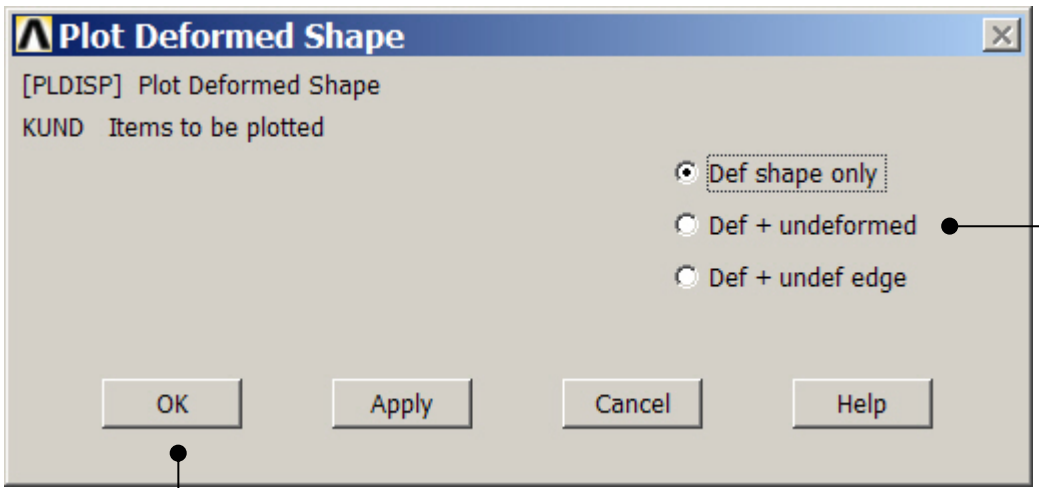
Example - Solve

Solution > Solve > Current LS



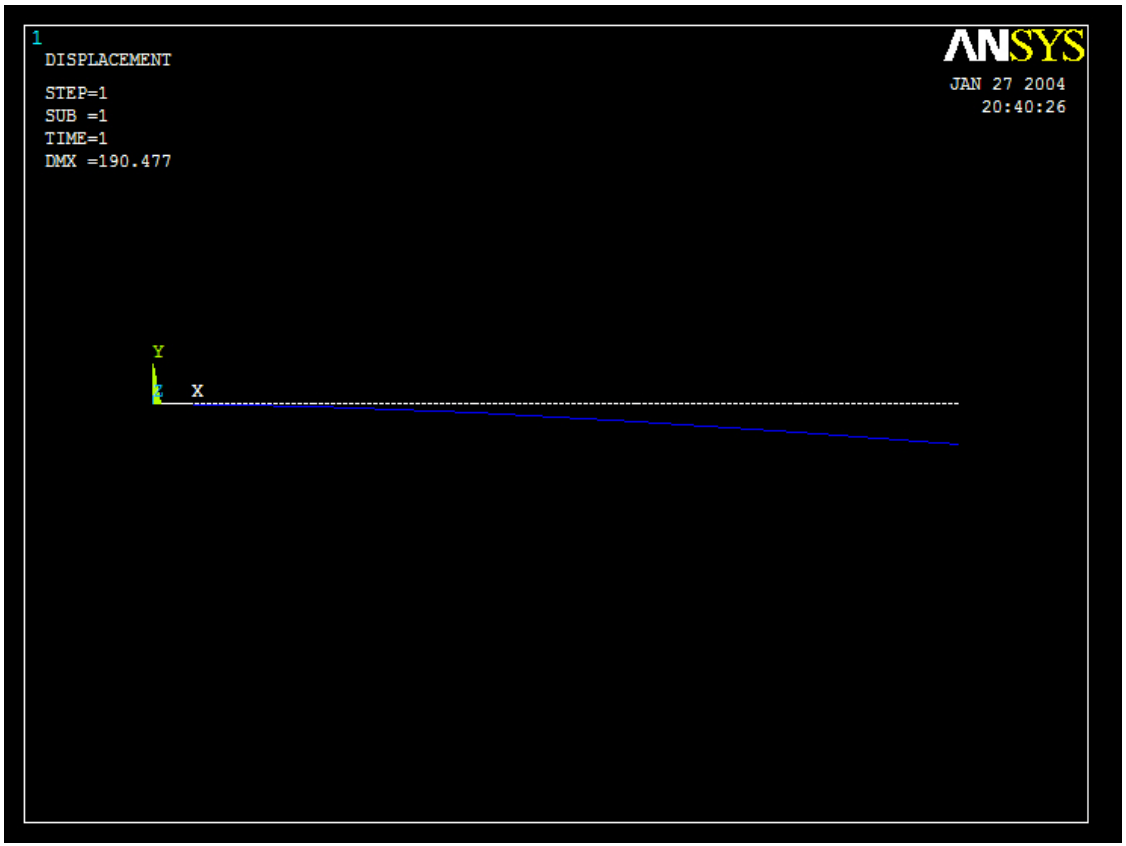
Example - PostProcessing

General Postproc > Plot Results > Deformed Shape



Select “Def+undeformed” and Press OK

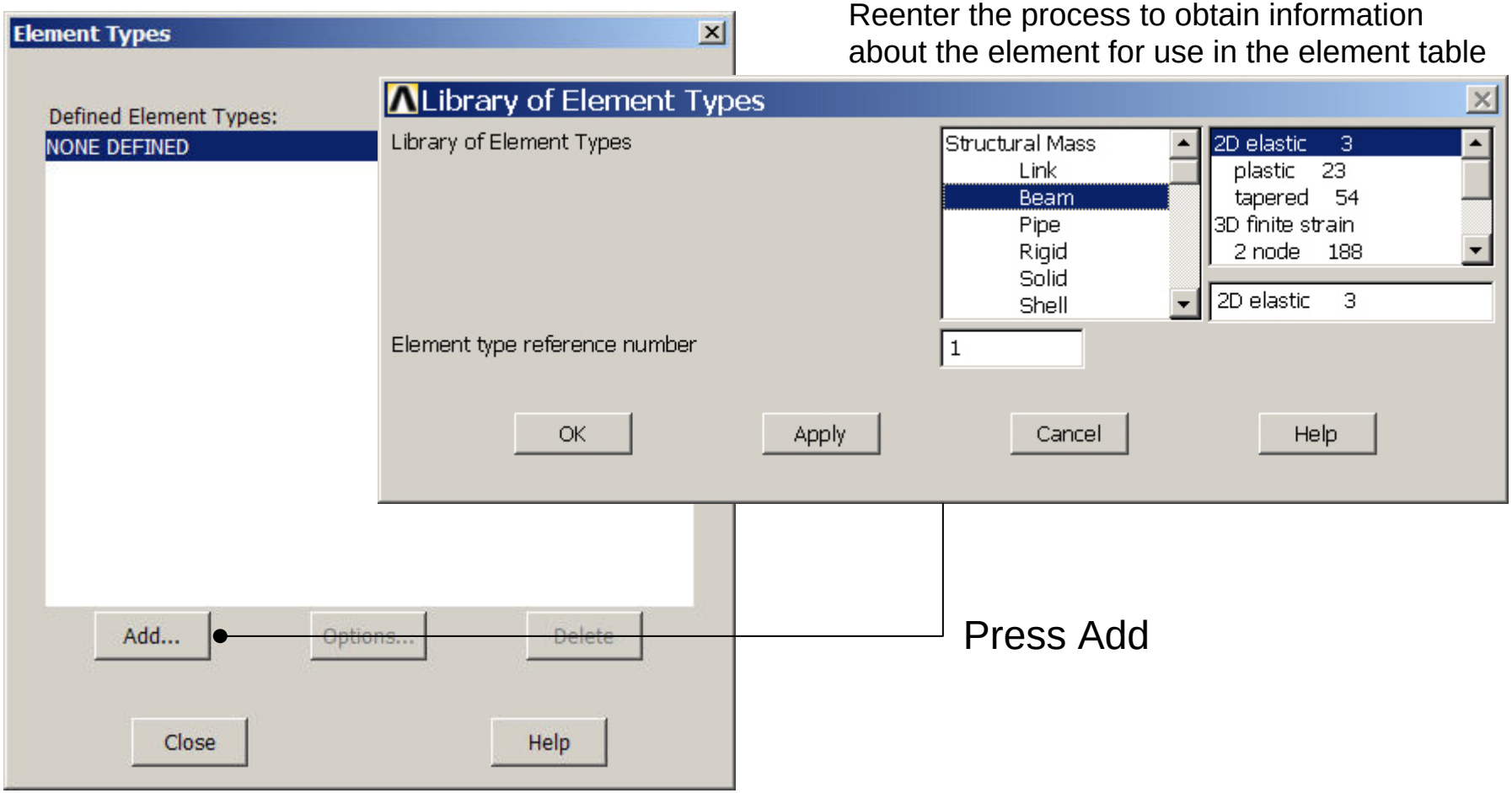
Example - PostProcessing



Read Maximum displacement: DMX

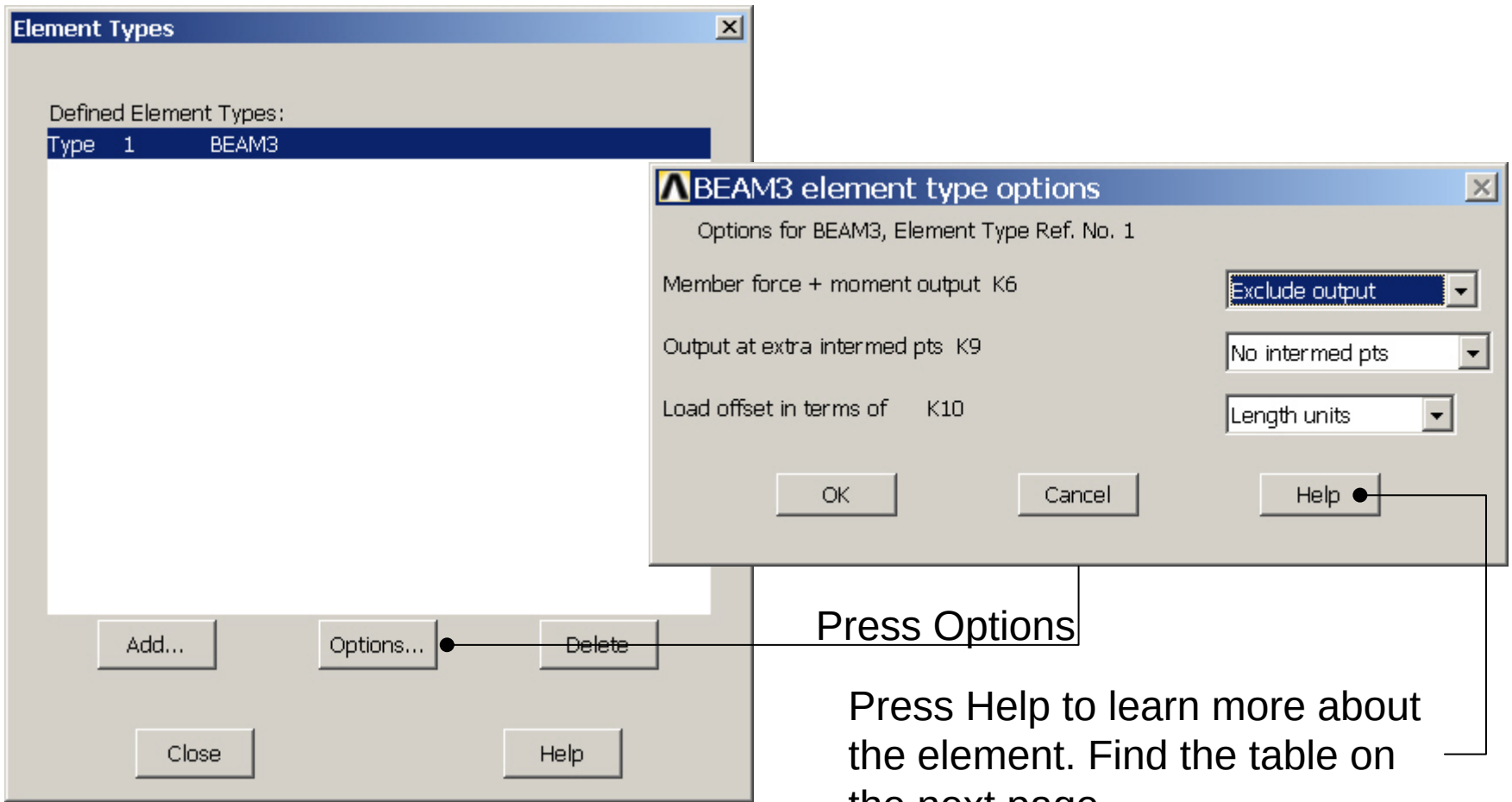
Example – Element Type

Preprocessor > Element Type > Add/Edit/Delete



Example - Element Type

Preprocessor > Element Type > Add/Edit/Delete



Example – Element Table

Find the following table for the element. Identify how to plot member forces in longitudinal direction of the beam element - MMOMZ

Name	Definition	O	R
EL	Element Number	Y	Y
NODES	Element nodes - I, J	Y	Y
MAT	Element material number	Y	Y
VOLU:	Element volume	N	Y
XC, YC	Location where results are reported	Y	3
TEMP	Temperatures T1, T2, T3, T4	Y	Y
PRES	Pressure P1 at nodes I,J; OFFST1 at I,J; P2 at I,J; OFFST2 at I, J; P3 at I; P4 at J	Y	Y
SDIR	Axial direct stress	1	1
SBYT	Bending stress on the element +Y side of the beam	1	1
SBYB	Bending stress on the element -Y side of the beam	1	1
SMAX	Maximum stress (direct stress + bending stress)	1	1
SMIN	Minimum stress (direct stress - bending stress)	1	1
EPELDIR	Axial elastic strain at the end	1	1
EPELBYT	Bending elastic strain on the element +Y side of the beam	1	1
EPELBYB	Bending elastic strain on the element -Y side of the beam	1	1
EPTHDIR	Axial thermal strain at the end	1	1
EPTHBYT	Bending thermal strain on the element +Y side of the beam	1	1
EPTHBYB	Bending thermal strain on the element -Y side of the beam	1	1
EPINAXL	Initial axial strain in the element	1	1
MFOR(X, Y)	Member forces in the element coordinate system X and Y direction	2	Y
MMOMZ	Member moment in the element coordinate system Z direction	2	Y

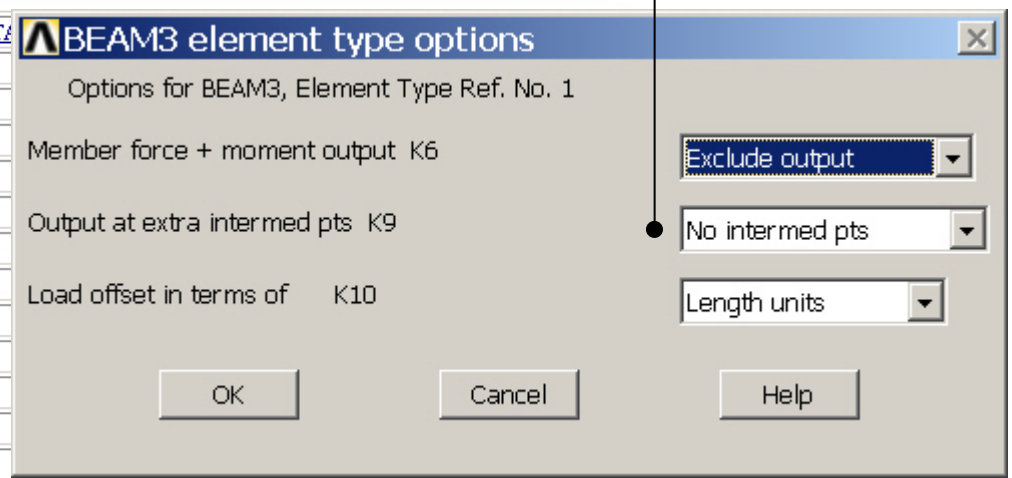
Example – Element Table

Find also the following table in the Help function

Table 3.2. BEAM3 Item and Sequence Numbers (KEYOPT(9) = 0)

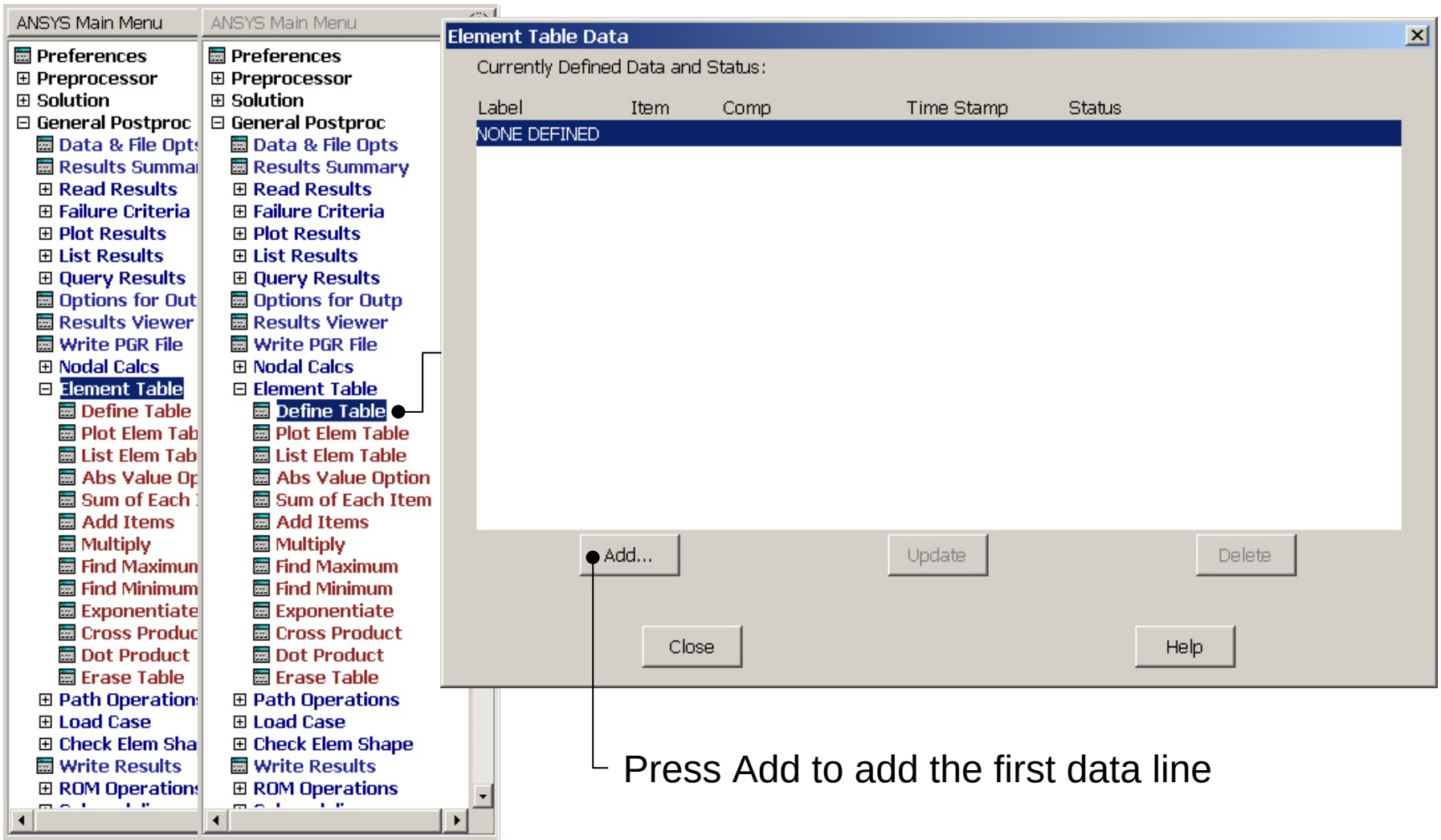
Output Quantity Name	Item			
SDIR	LS			
SBYT	LS			
SBYB	LS			
EPELDIR	LEPEL			
EPELBYT	LEPEL			
EPELBYB	LEPEL			
EPTHDIR	LEPTH			
EPTHBYT	LEPTH			
EPTHBYB	LEPTH			
EPINAXL	LEPTH			
SMAX	NMISC			
SMIN	NMISC	-	2	4
MFORX	SMISC	-	1	7
MFORY	SMISC	-	2	8
MMOMZ	SMISC	-	6	12
P1	SMISC	-	13	14
OFFST1	SMISC	-		
P2	SMISC	-		
OFFST2	SMISC	-	19	20
P3	SMISC	-	21	-
P4	SMISC	-	-	22

		Pseudo Node			
		1	2	3	4
TEMP	LBFE	1	2	3	4

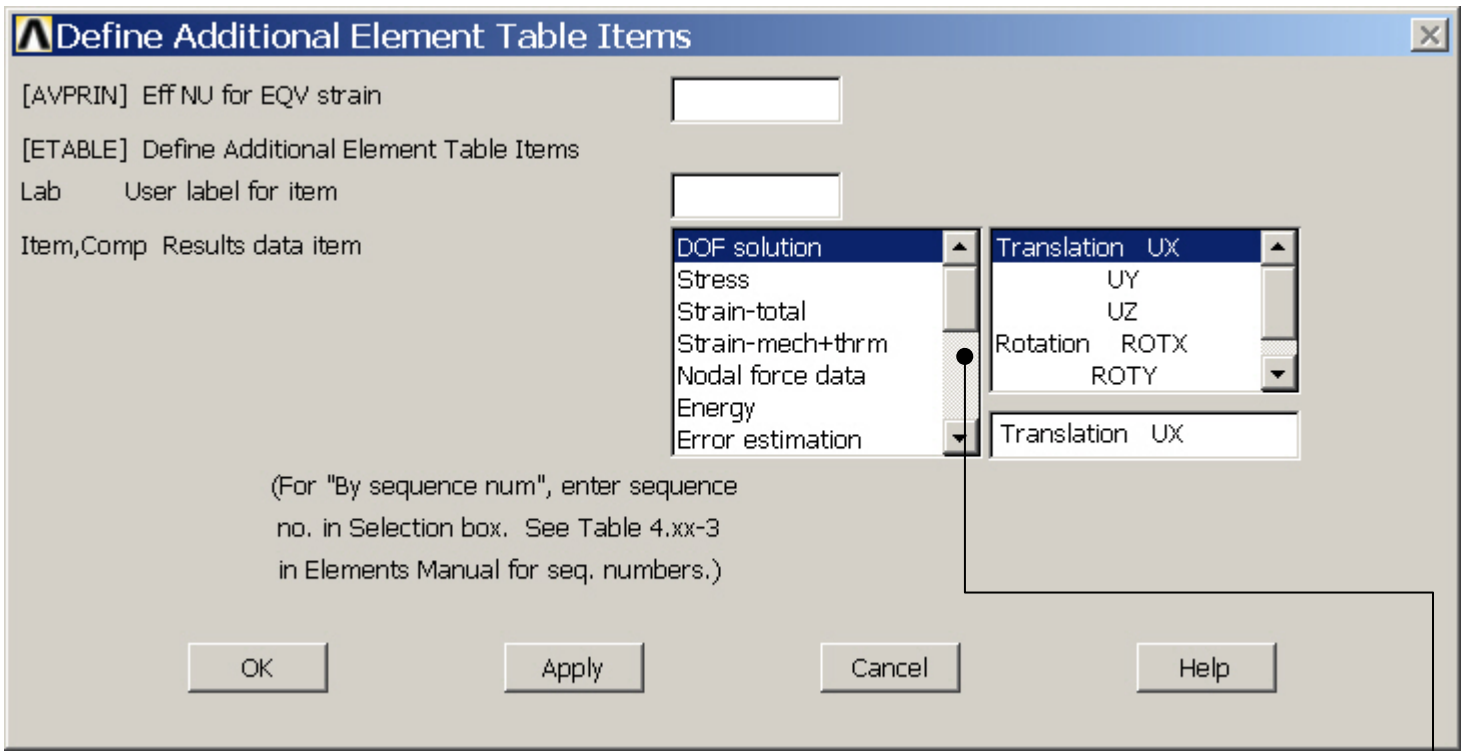


Remember MMOMZ, SMISC,6,12

Example – Element Table

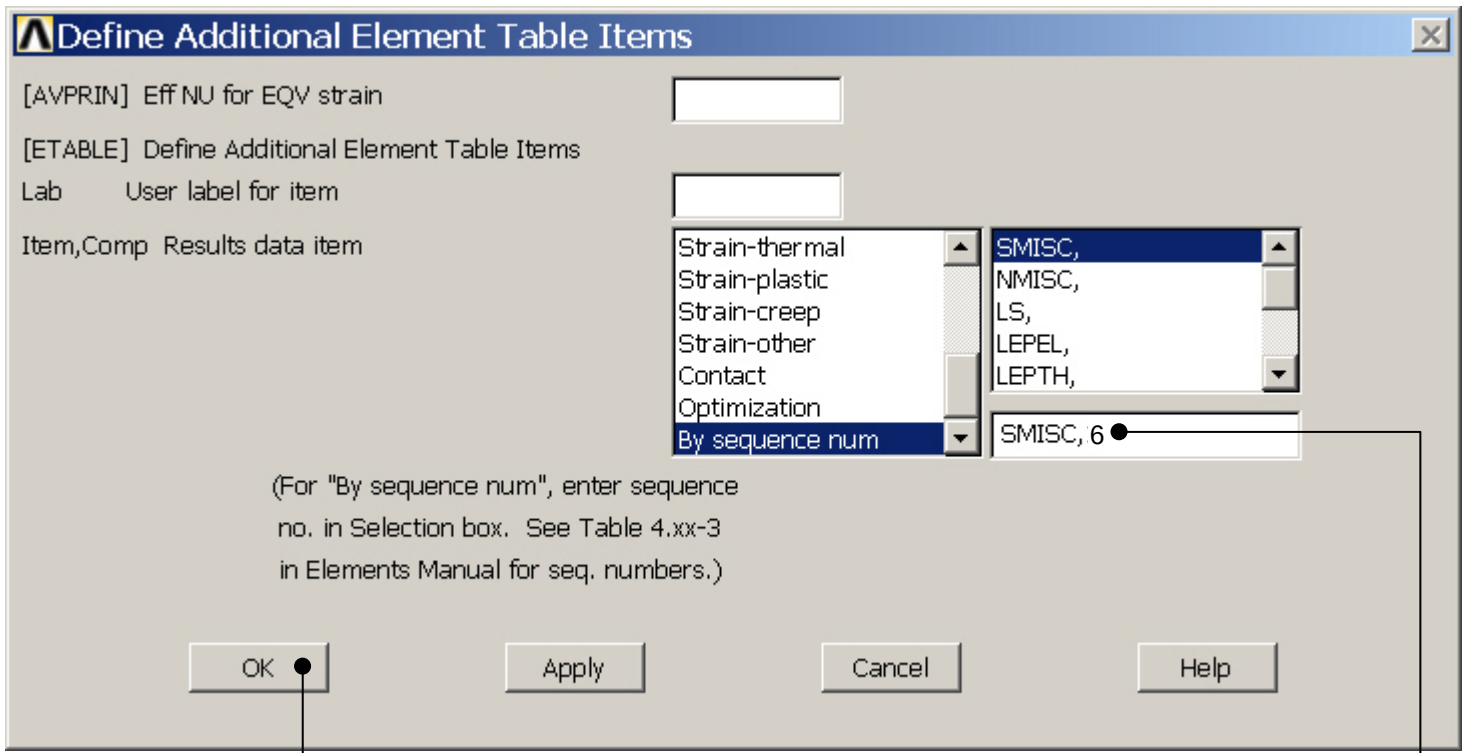


Example – Element Table



Scroll down in this menu to find the line “By sequence number”

Example – Element Table

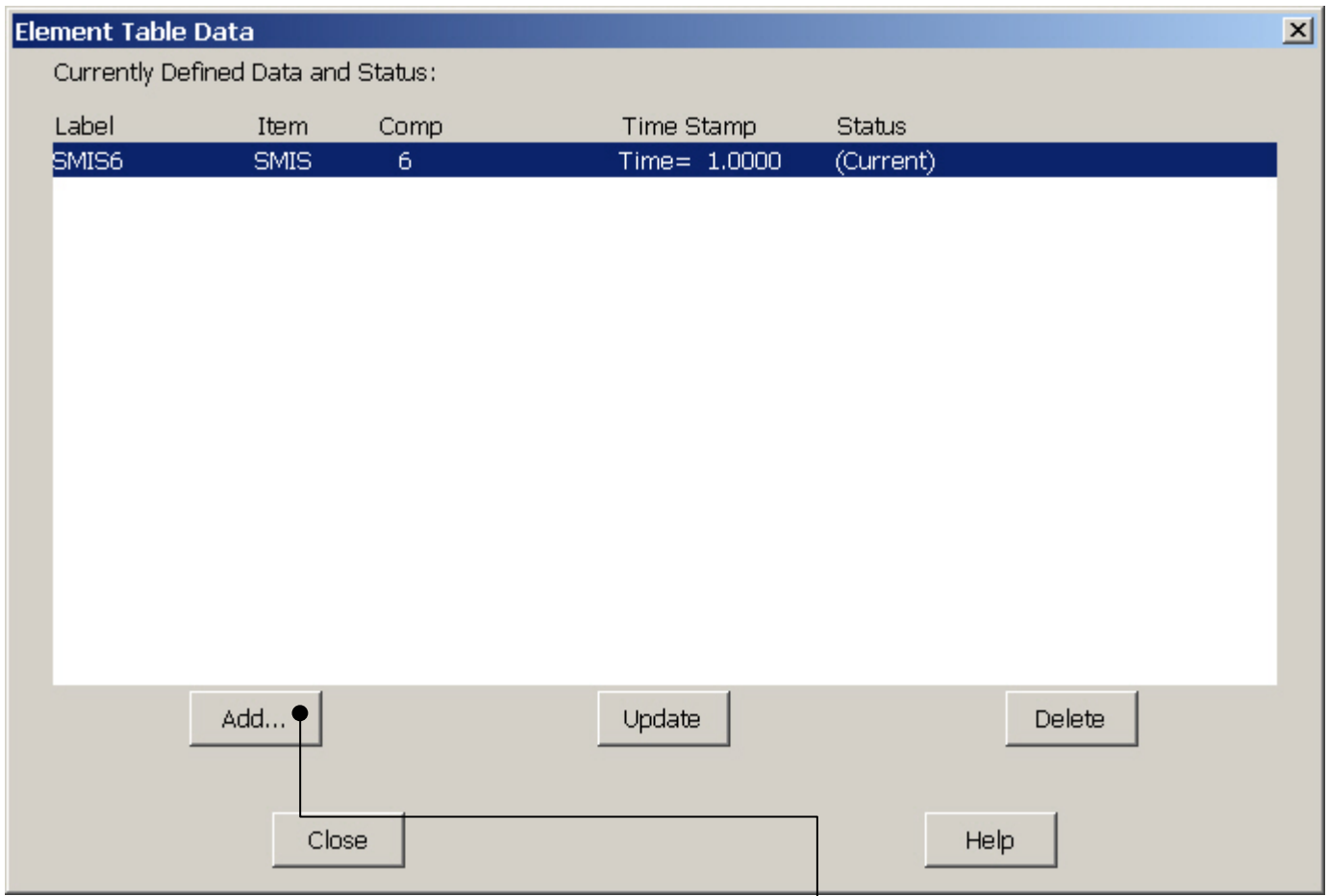


Press OK

Enter 6 as found in table 3.2

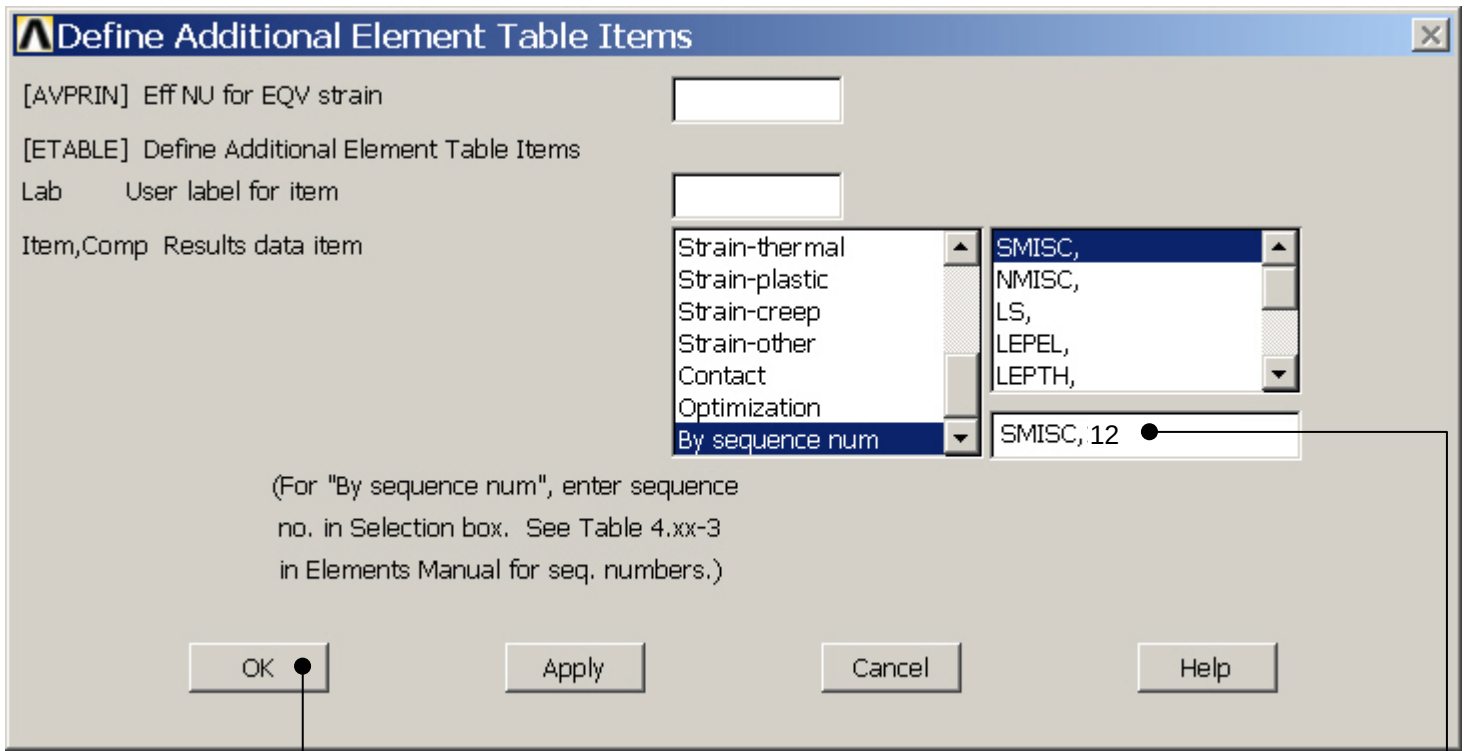
From table 3.2 MFORX, SMISC,6,12

Example – Element Table



Press Add to add the second data line

Example – Element Table

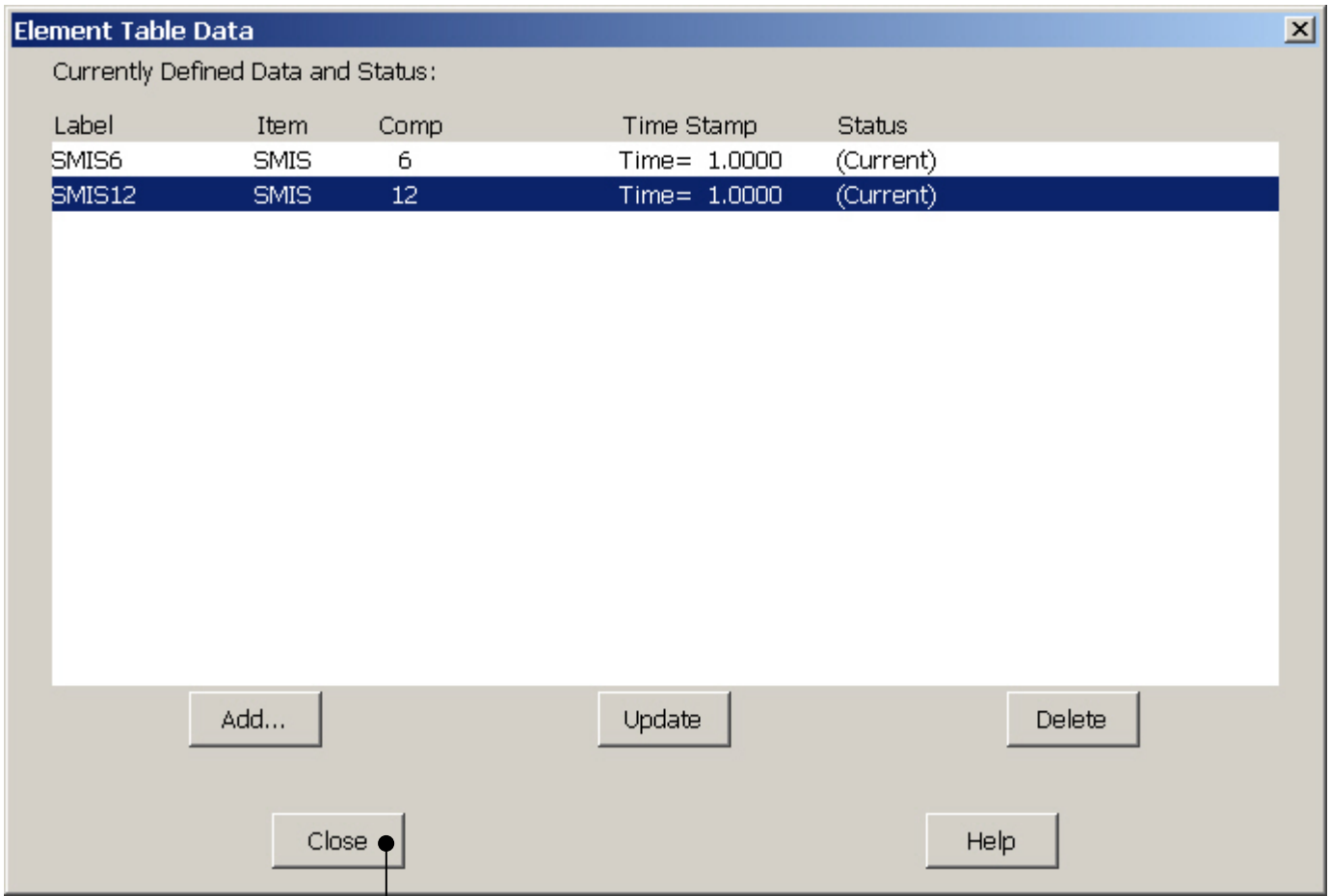


Press OK

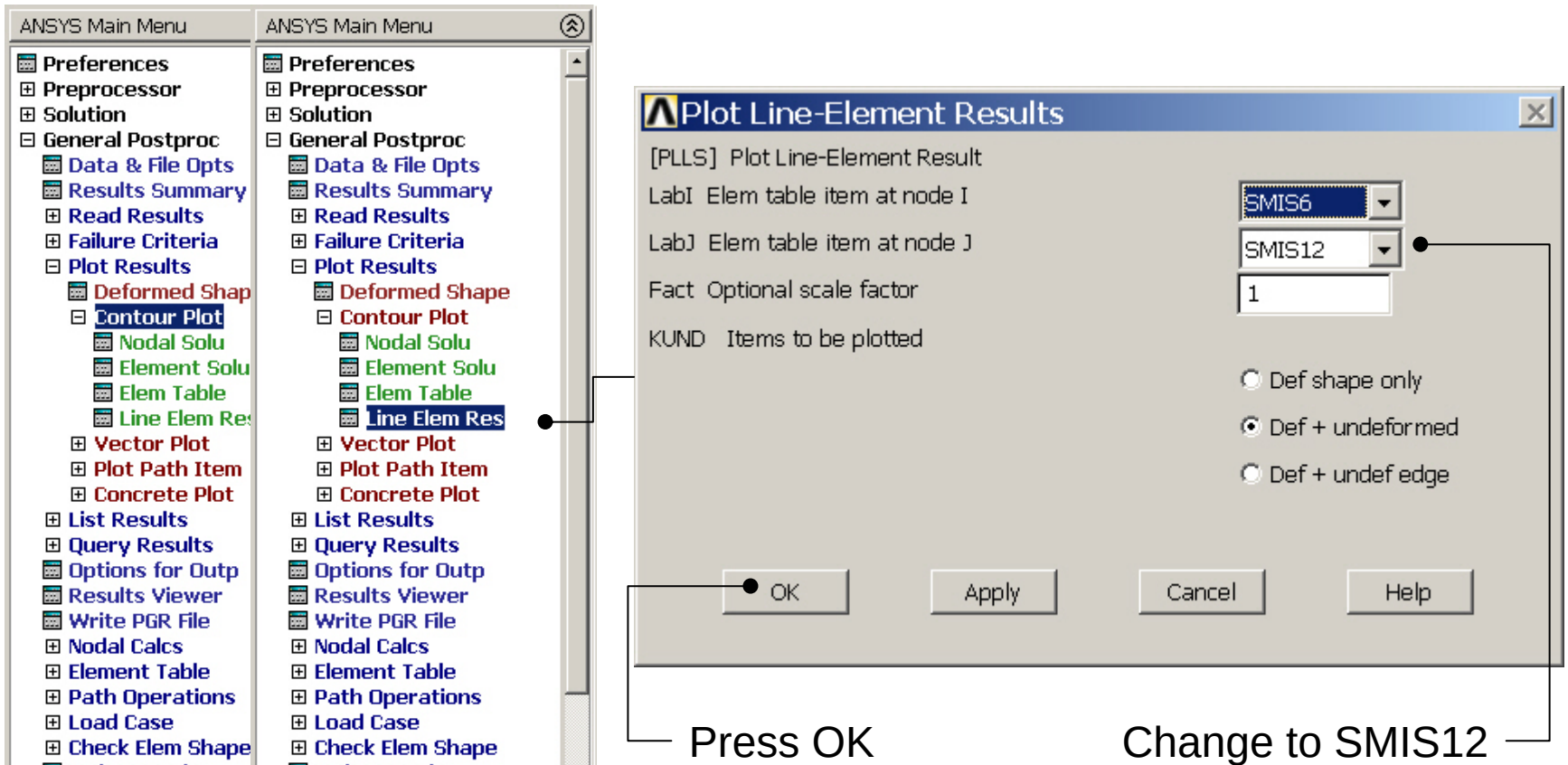
Enter 12 as found in table 3.2

From table 3.2 MFORX, SMISC,6,12

Example – Element Table



Example – Plot Line-Element



Example – Plot Line-Element