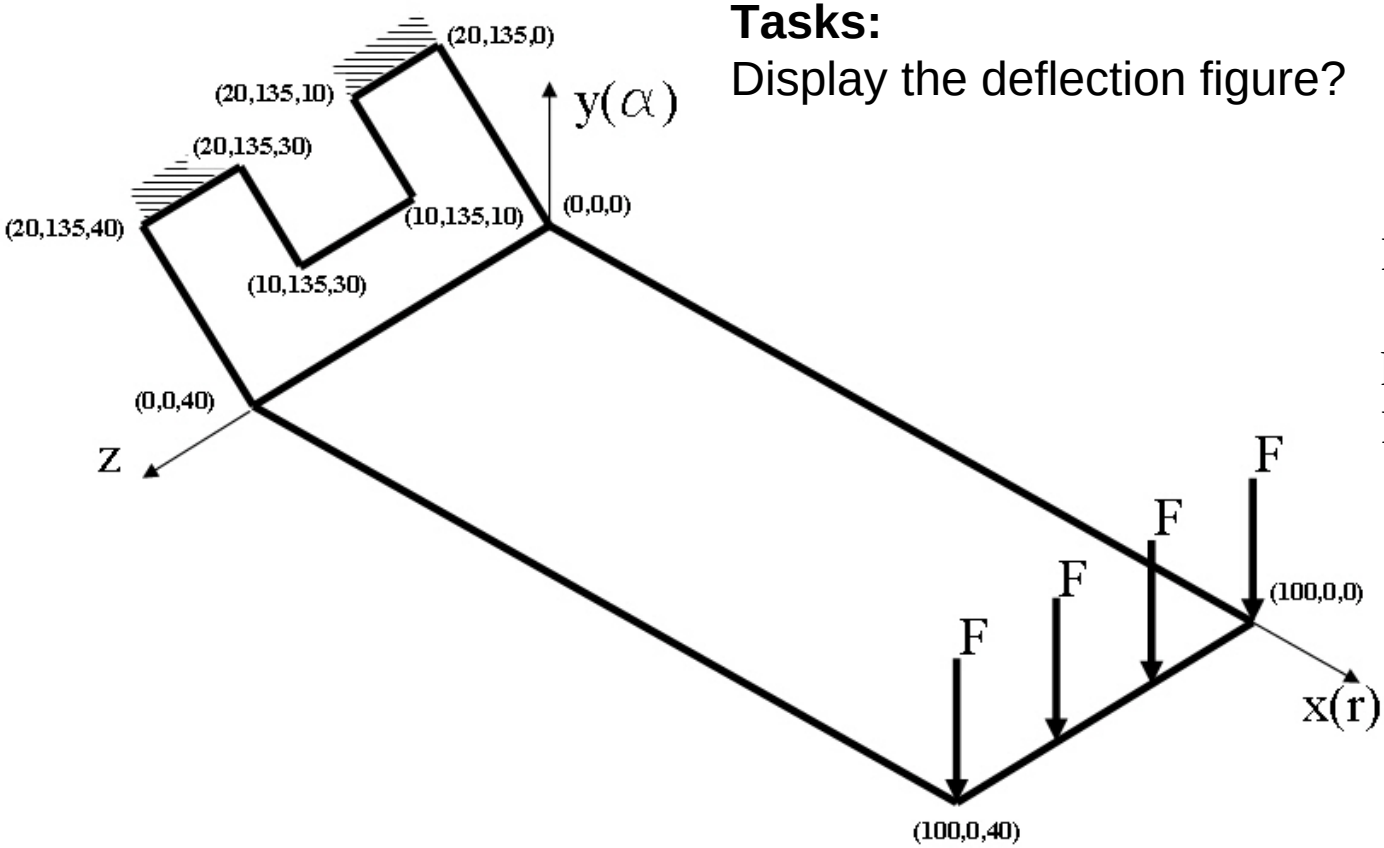
Course in ANSYS

Example0301

Example – Flap

Objective:
Compute the critical buckling load and display the mode shape

Tasks:
Display the deflection figure?

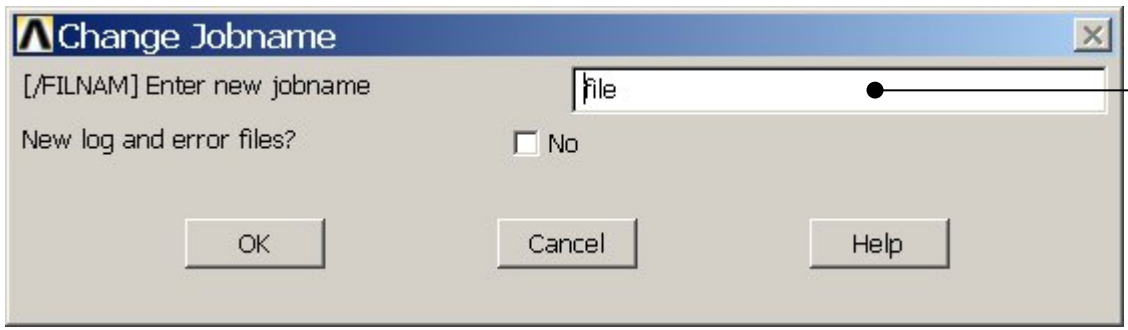


$E = 210000 N/mm^2$
$\nu = 0.3$
$h = 2mm$
$F = 1.2N$

Example - title

Utility Menu > File > Change Jobname — GUI

/jobname, Example0301 — Command line entry

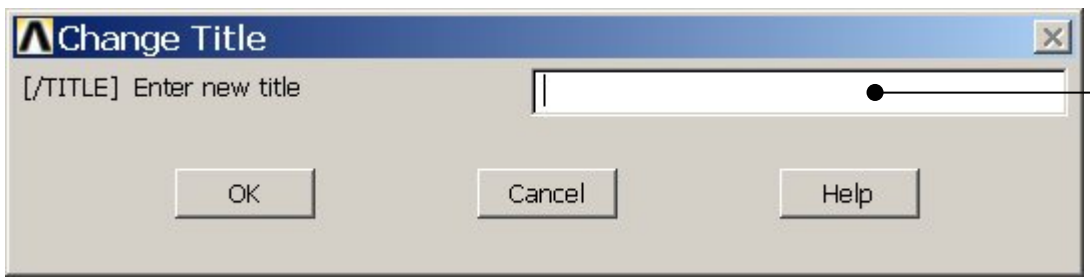


Enter: Example0301

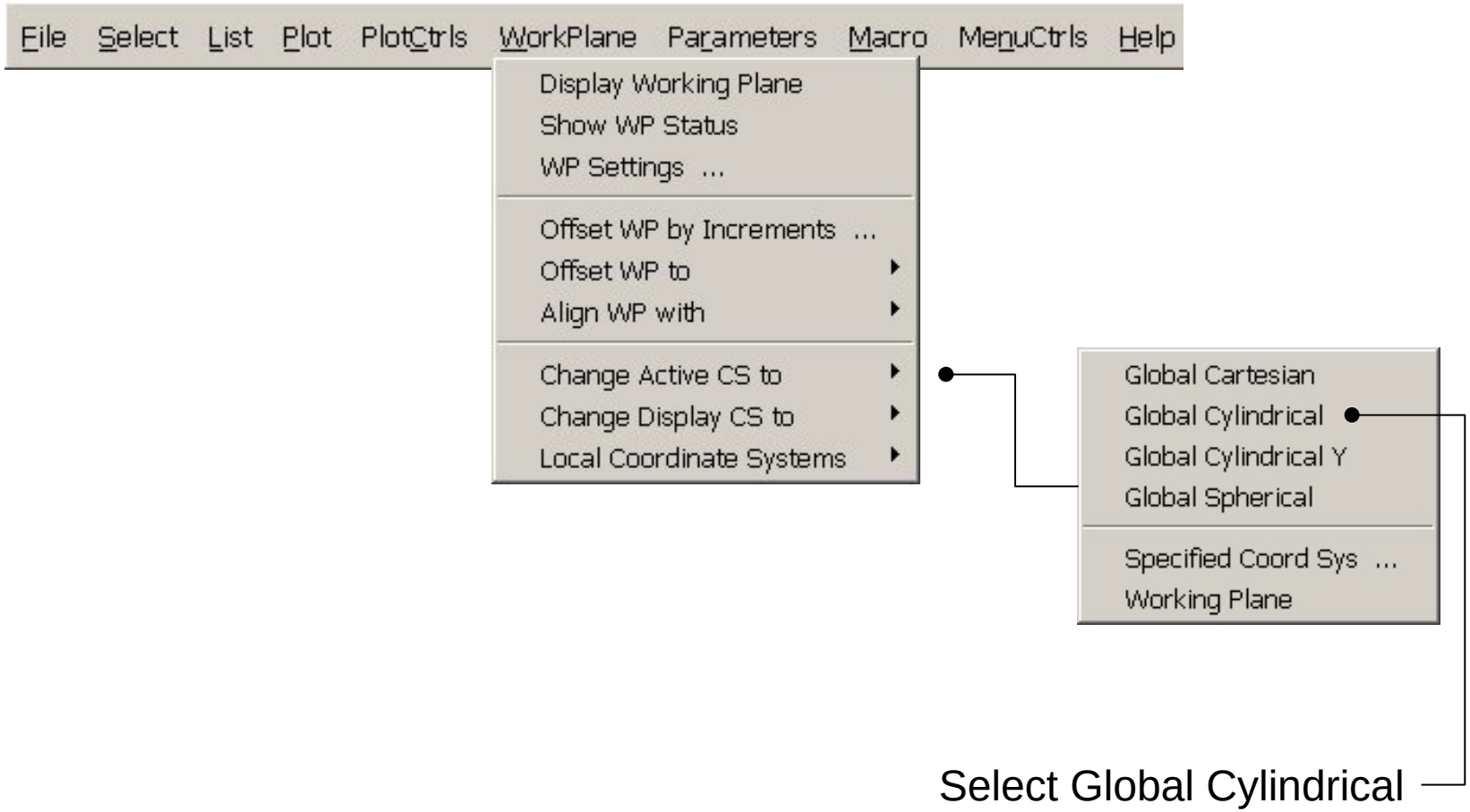
Utility Menu > File > Change Title

/title, Flap

Enter: Flap



ANSYS Menus - WorkPlane Menu



Example - Keypoints

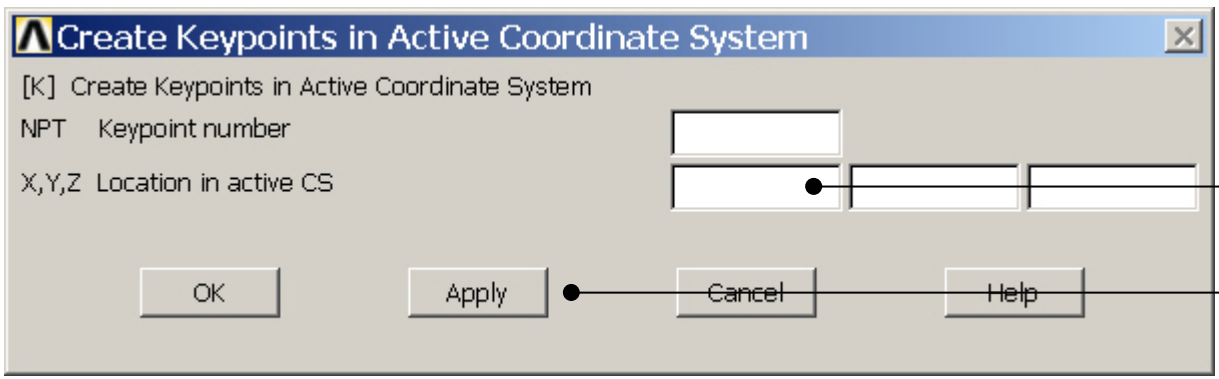
Preprocessor > Modeling > Create > Keypoints > In Active CS

Note: An empty # result in automatic numbering.

General format:
K,#,X,Y,Z

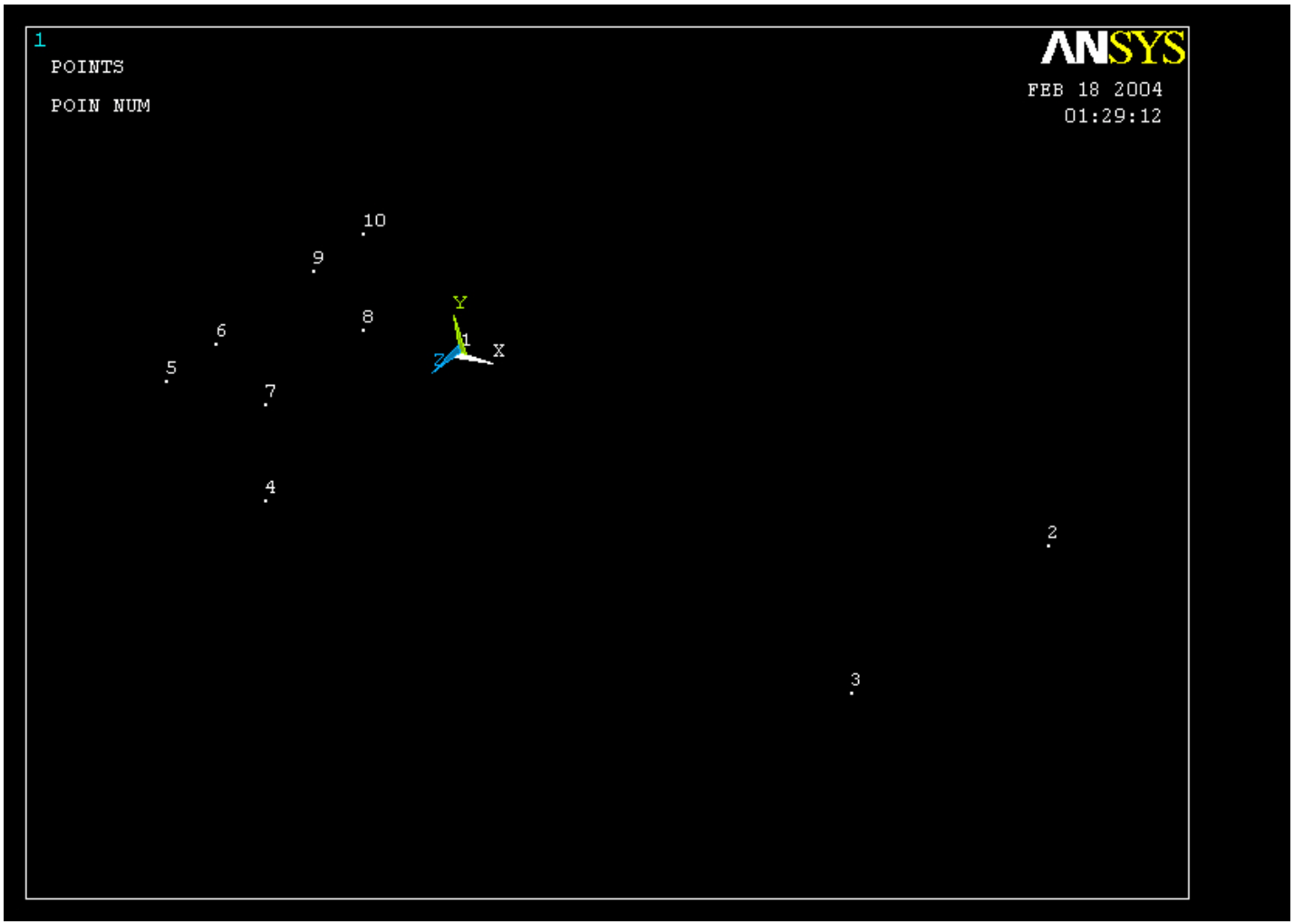
Keypoint number
X Keypoint x-coordinate
Y Keypoint y-coordinate
Z Keypoint z-coordinate

Enter the keypoints from the figure



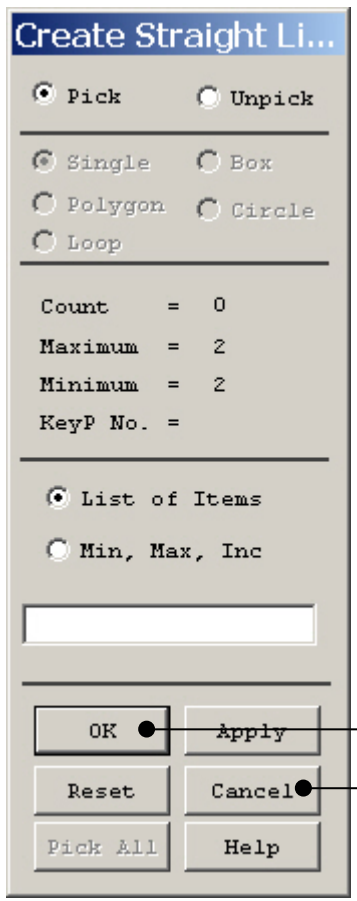
Note: An empty box result in a zero.

Example - Keypoints



Example - Lines

Preprocessor > Modeling > Create > Lines > Lines > Straight Line
Create a line between Keypoint 1 and Keypoint 2 and so on.
L,1,2
L,2,3



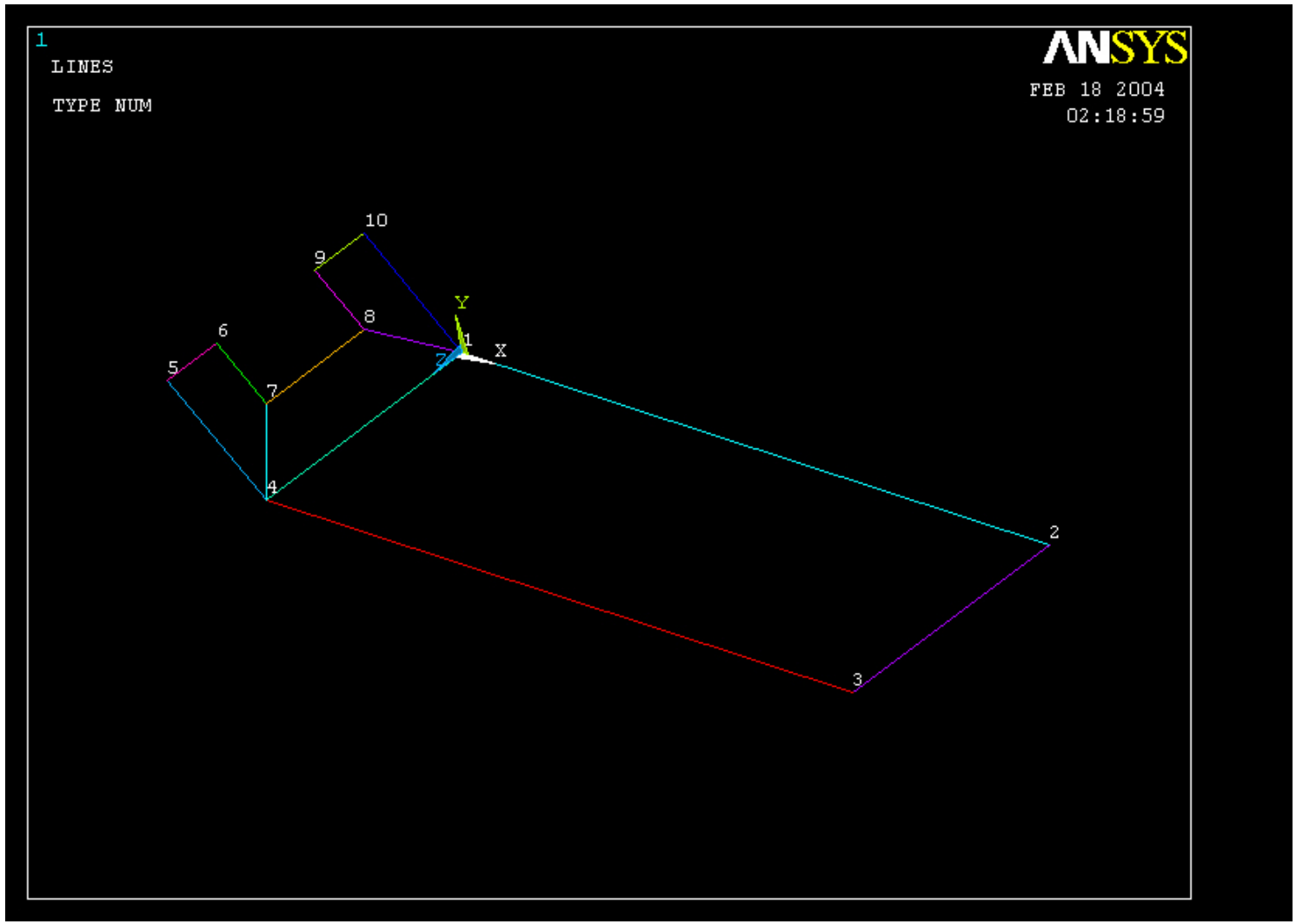
HINT: By clicking with the right-hand mouse button you shift between the Pick/Unpick function. This is indicated by the direction of the cursor arrow:

Pick: upward arrow

Unpick: downward arrow

Press OK or Cancel to finish selection

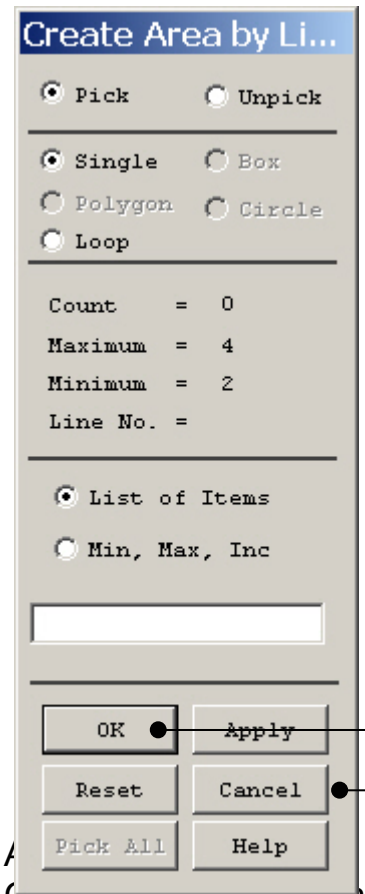
Example - Lines



Example - Areas

Preprocessor > Modeling > Create > Areas > Arbitrary > By Lines

Create 2 areas



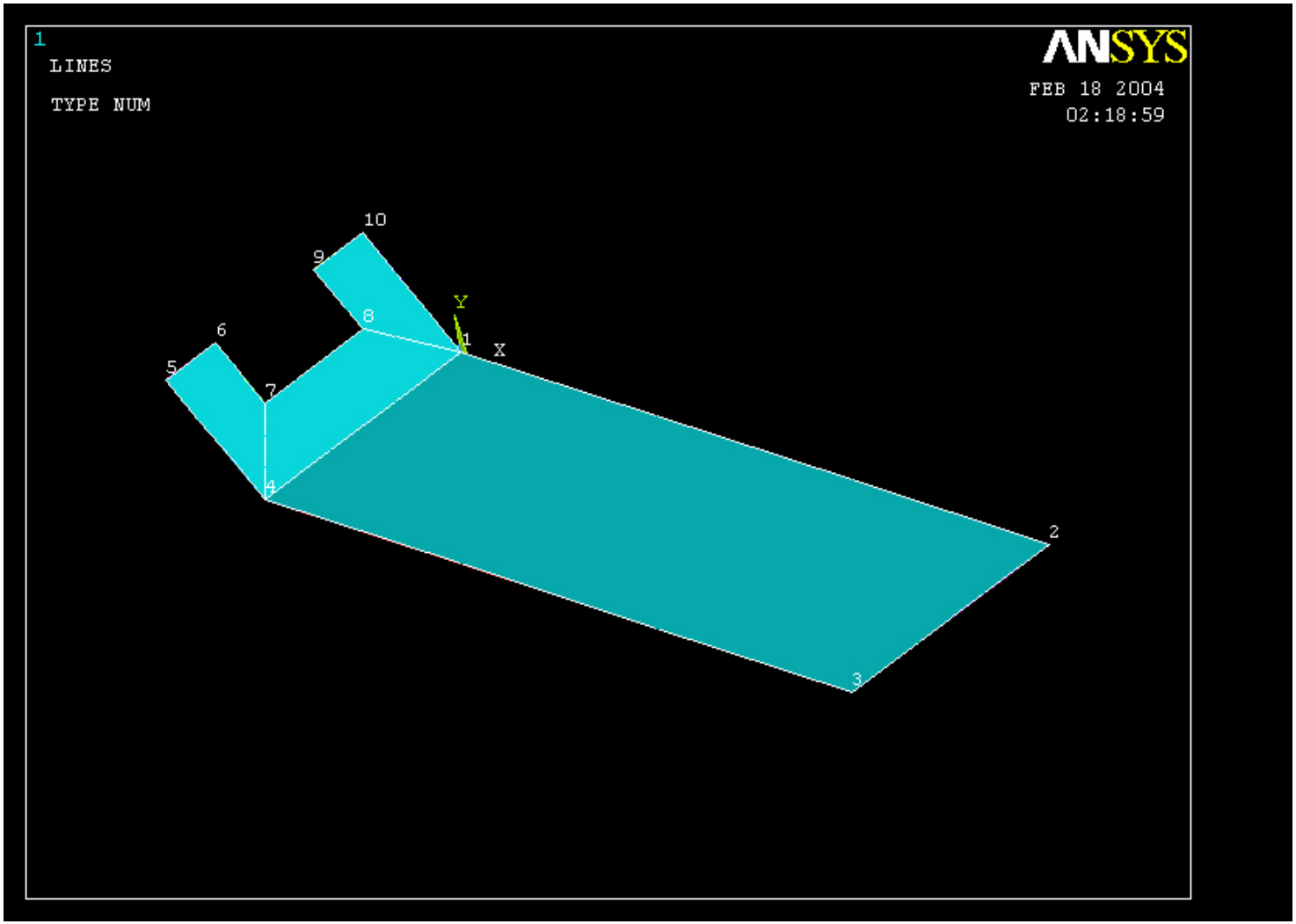
HINT: By clicking with the right-hand mouse button you shift between the Pick/Unpick function. This is indicated by the direction of the cursor arrow:

Pick: upward arrow

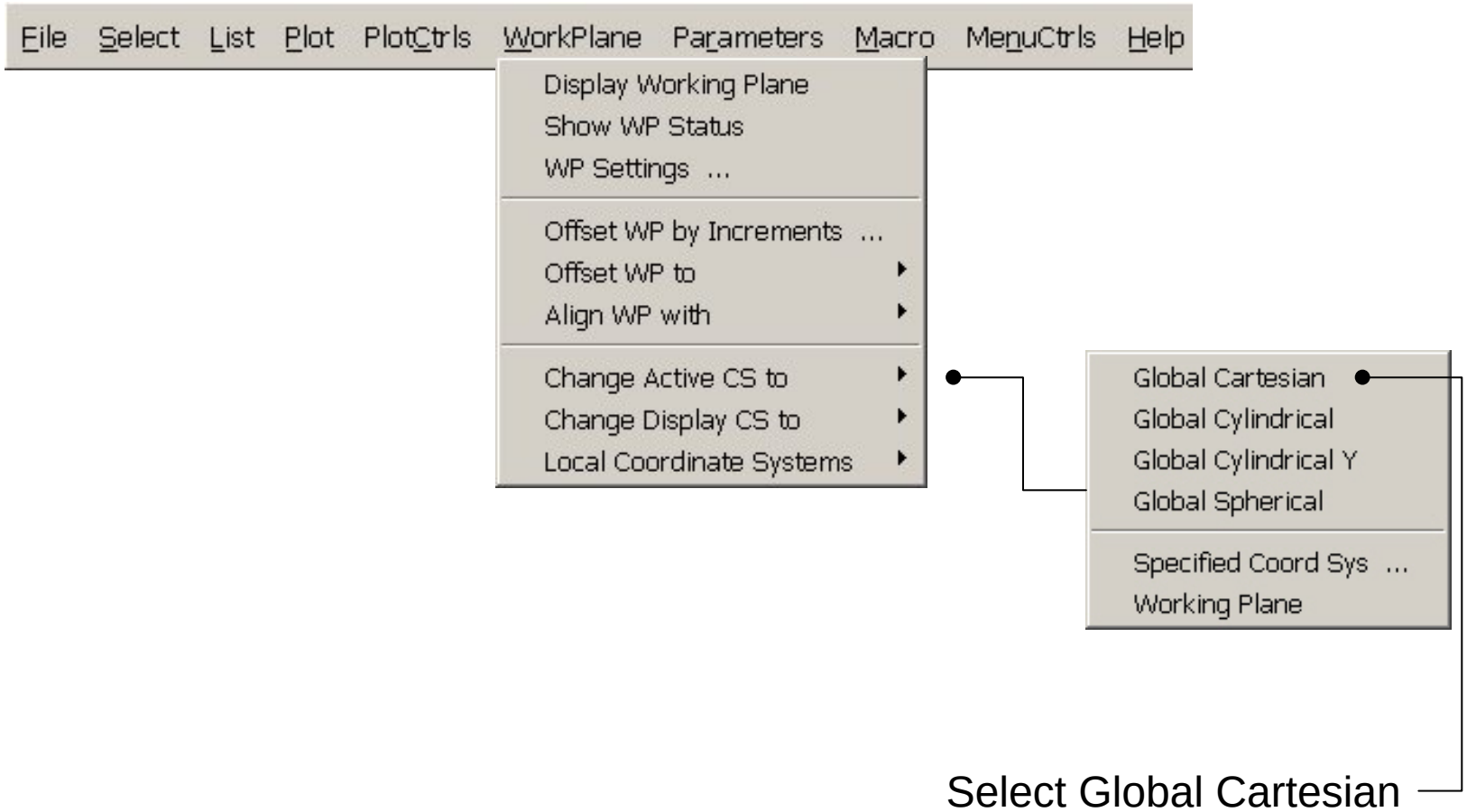
Unpick: downward arrow

Press OK or Cancel to finish selection

Example - Areas

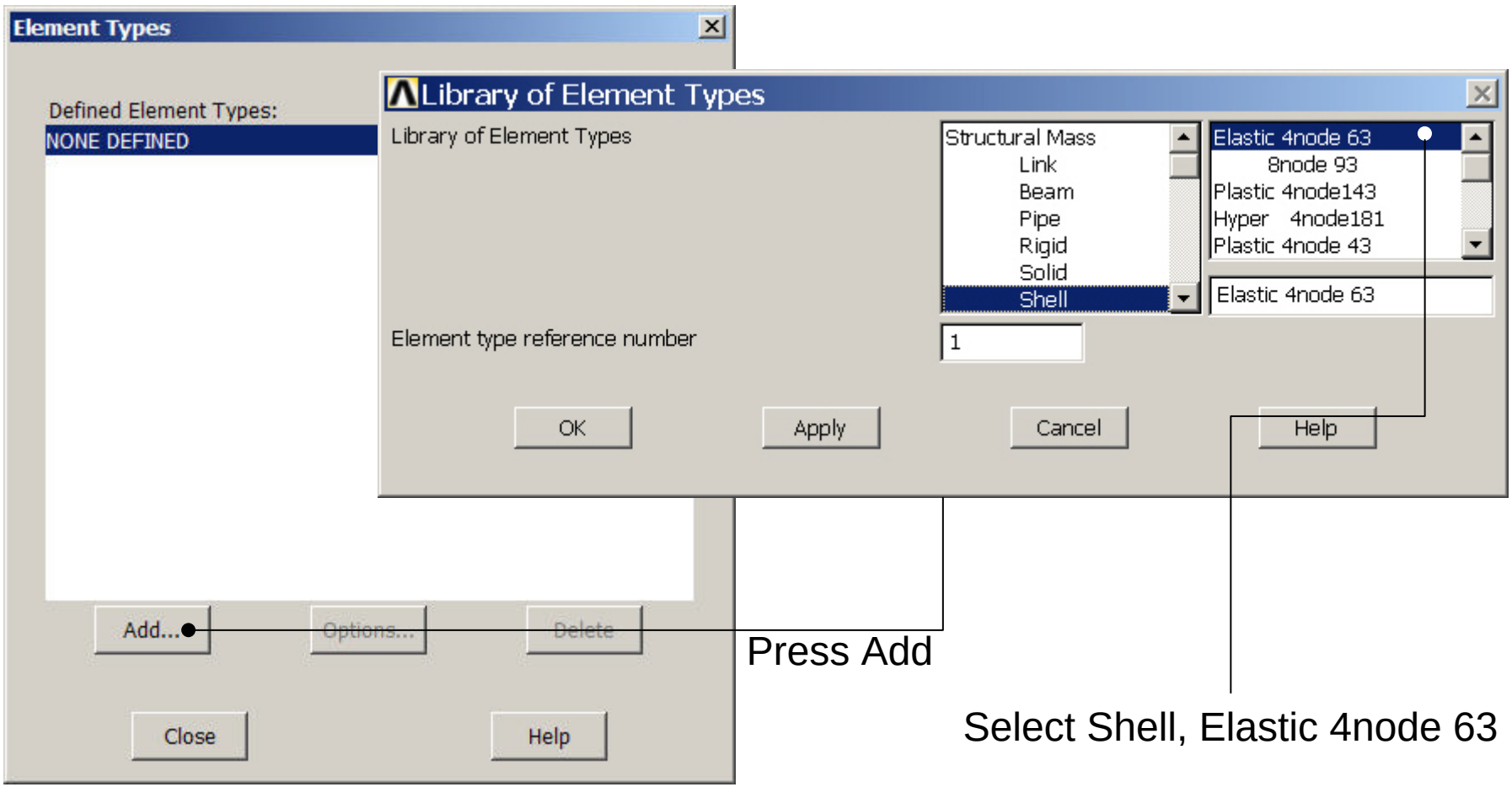


Example – Change CS

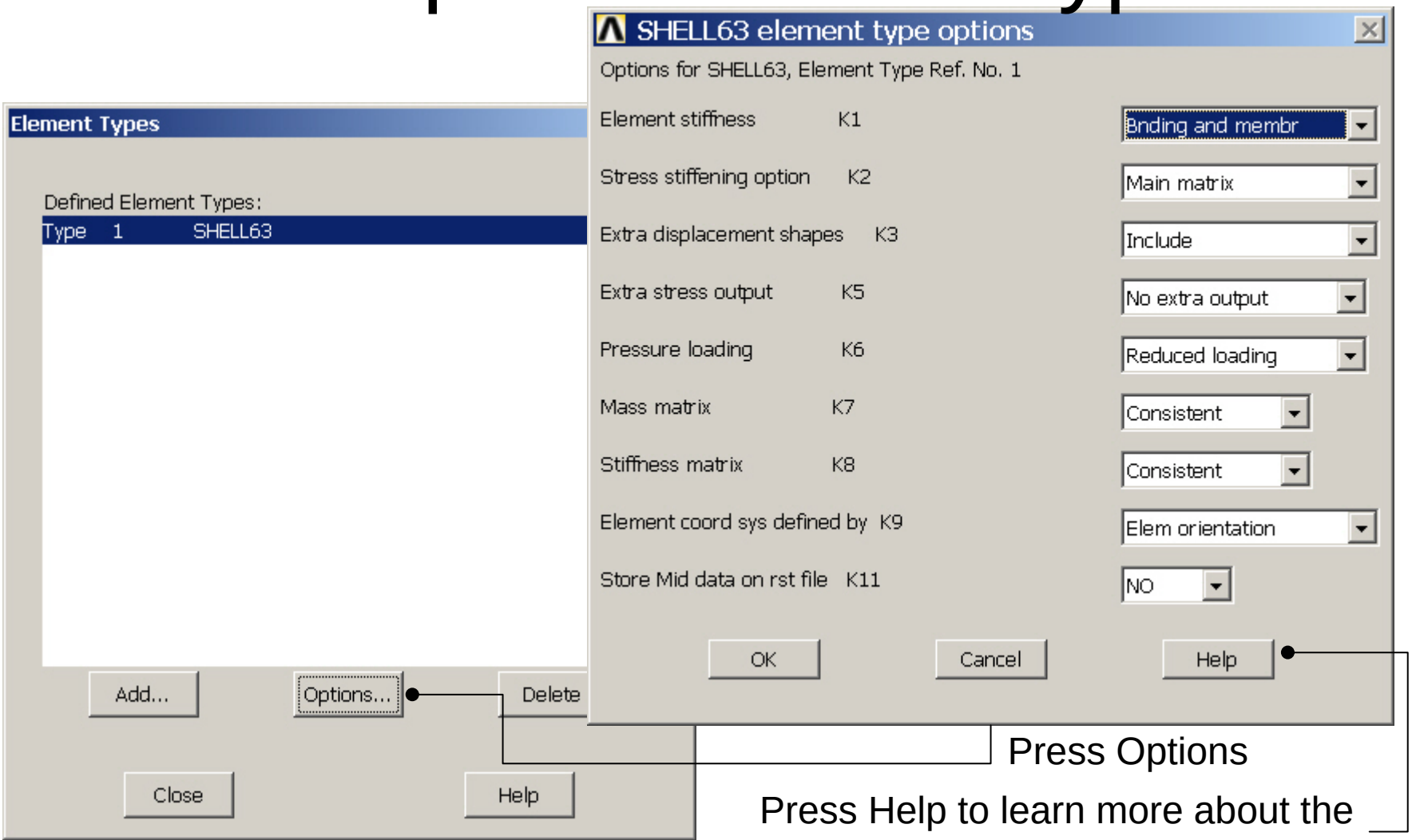


Example – Element Type

Preprocessor > Element Type > Add/Edit/Delete



Example - Element Type

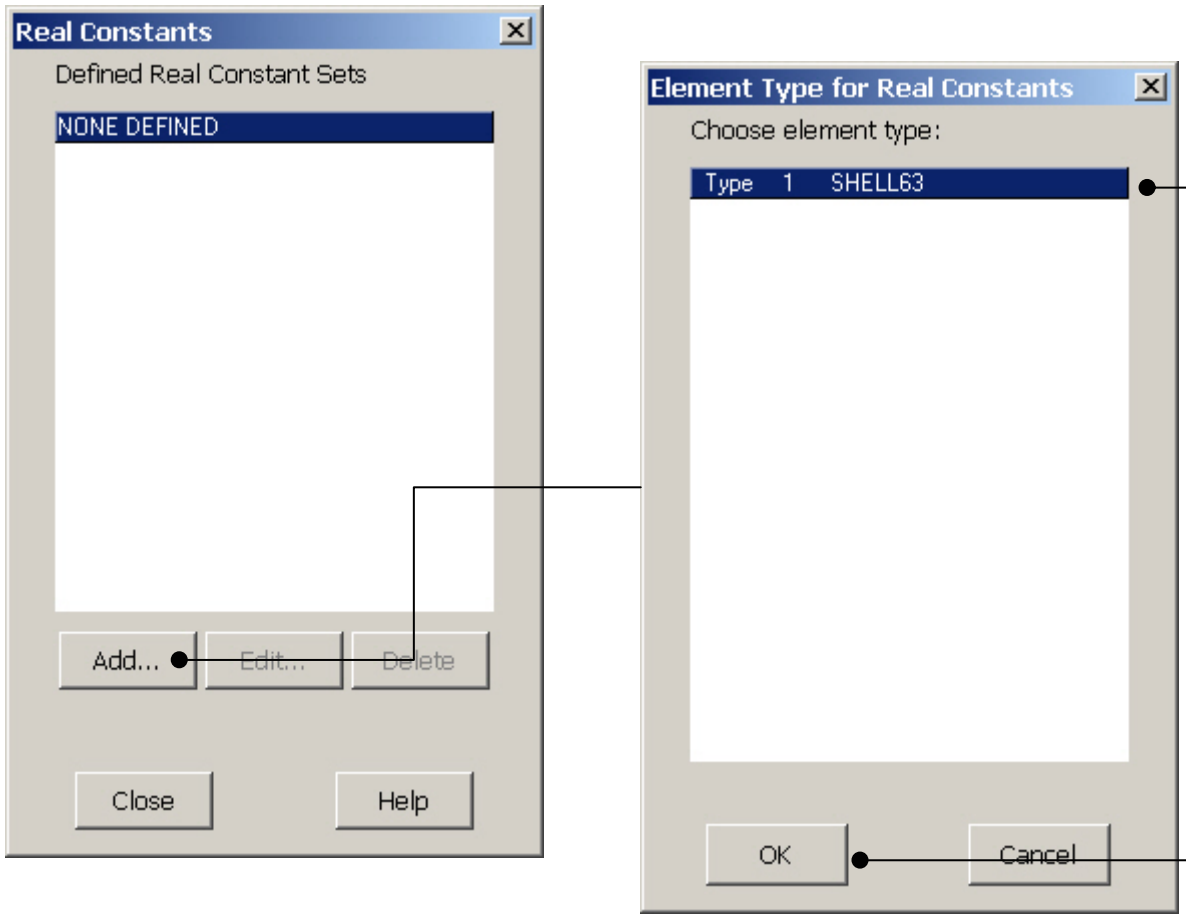


Press Options

Press Help to learn more about the element.

Example – Real Constants

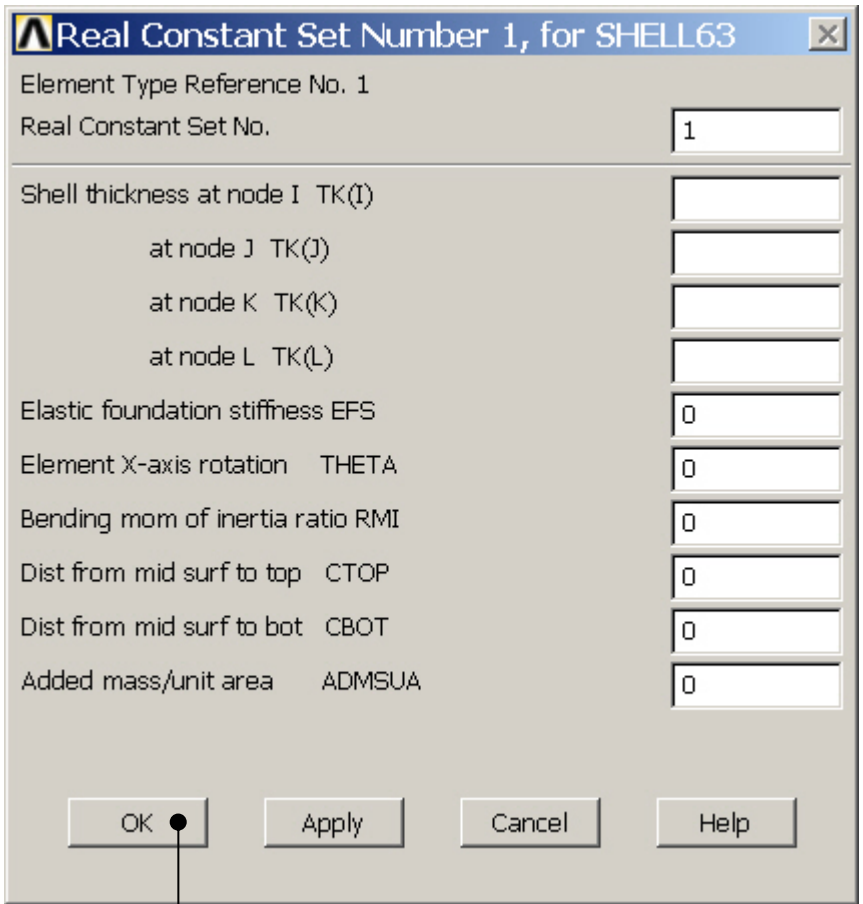
Preprocessor > Real Constants > Add



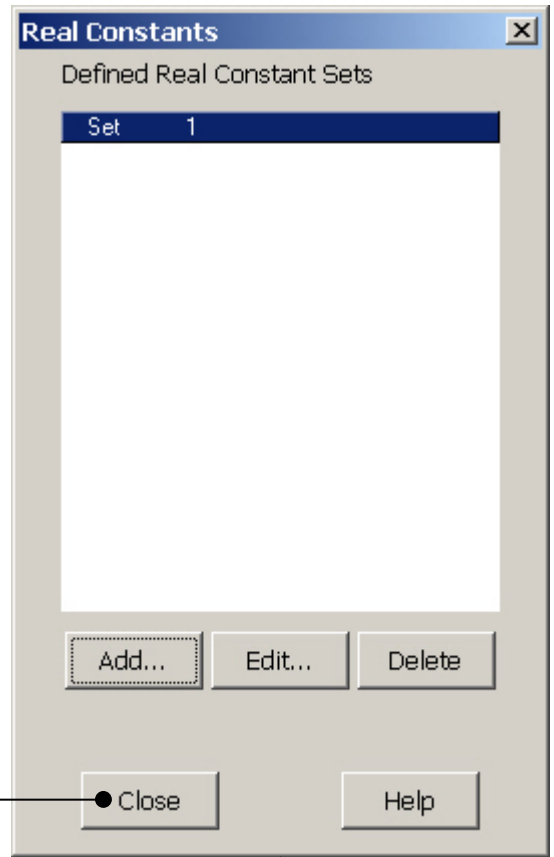
Place the cursor on the relevant element and press OK

Example - Real Constants

Preprocessor > Real Constants > Add



Enter thickness 2

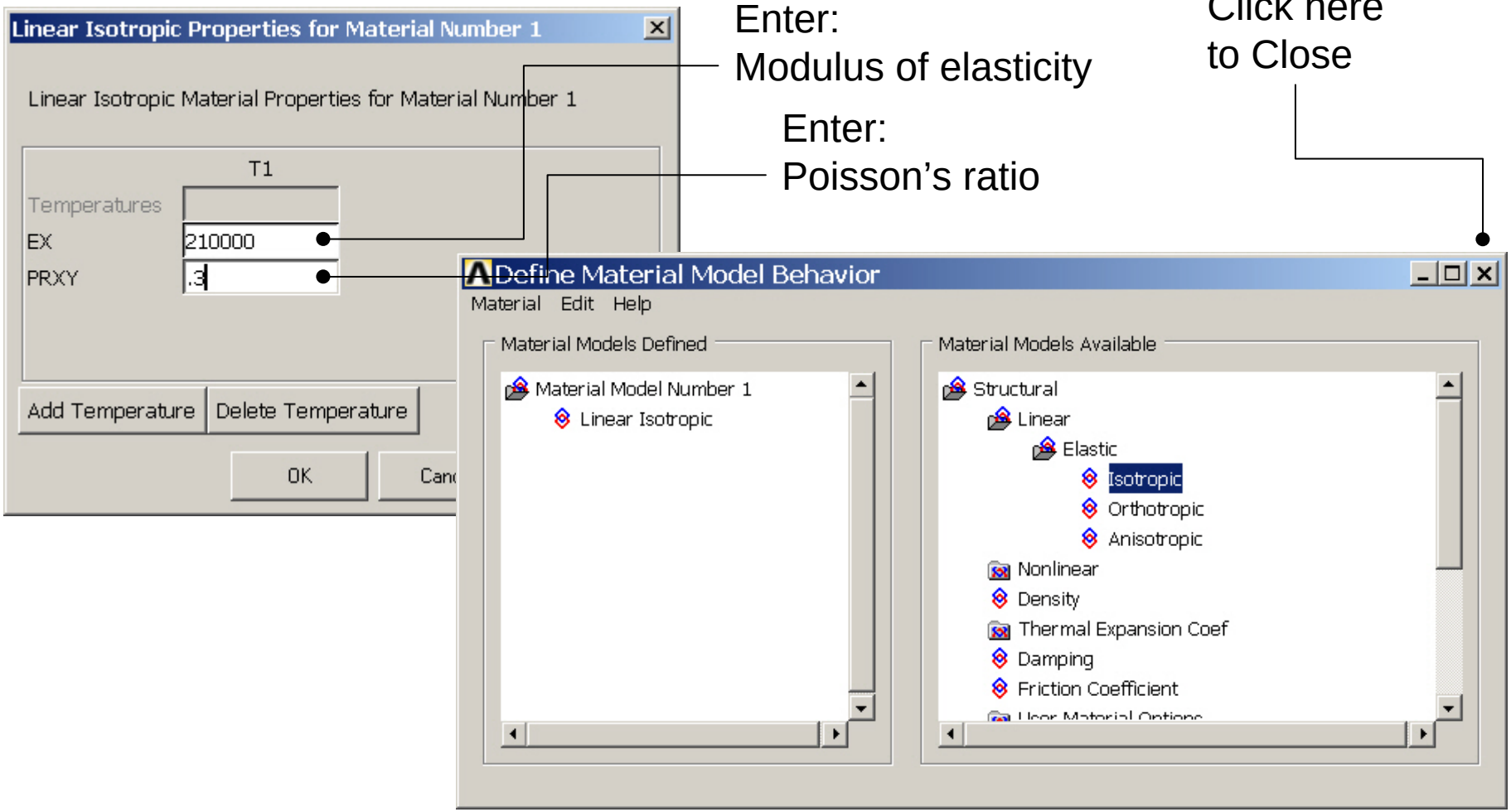


Press Close to finish

Press OK

Example - Material Properties

Preprocessor > Material Props > Material Models



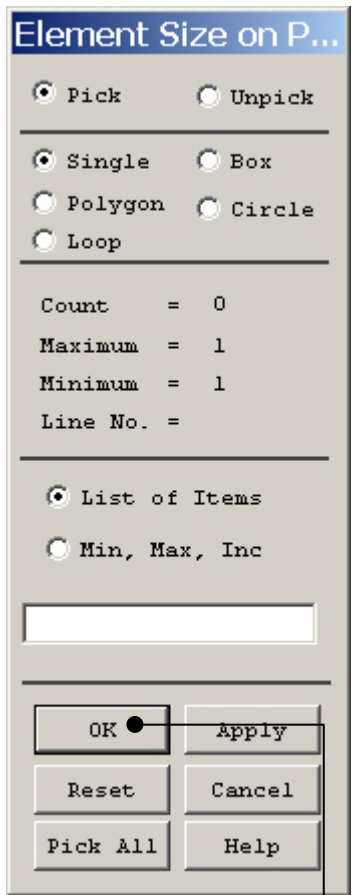
Enter:
Modulus of elasticity

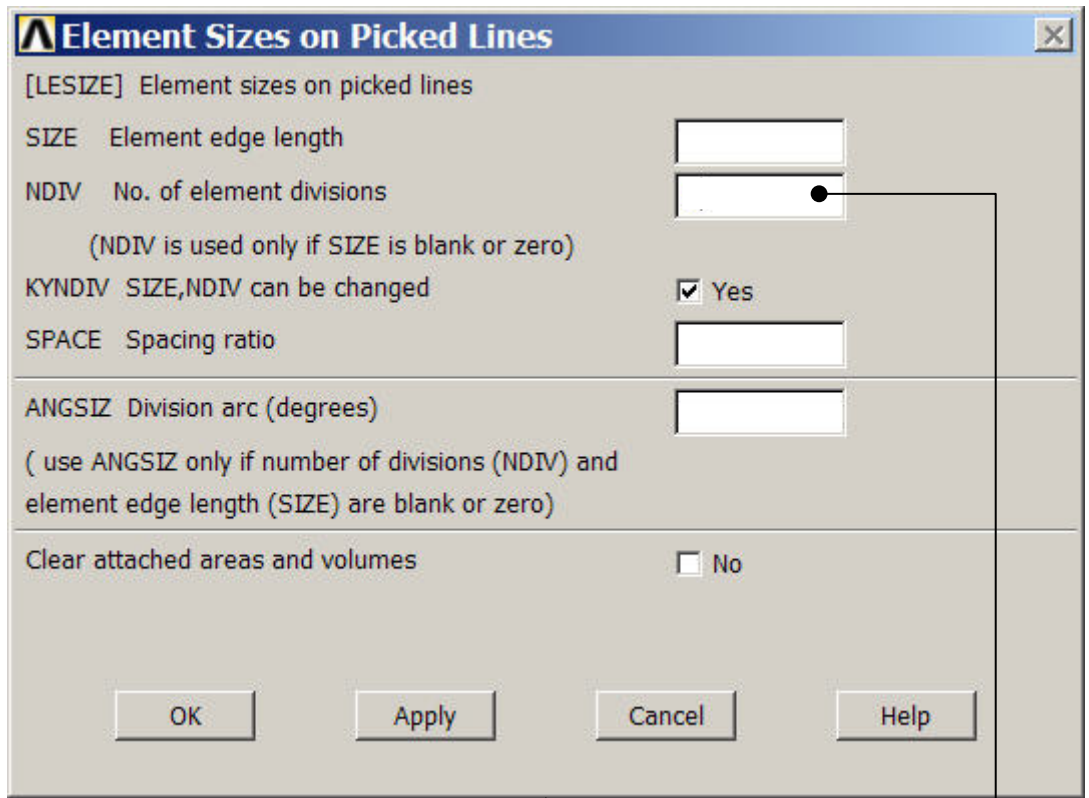
Enter:
Poisson's ratio

Click here
to Close

Example - Meshing

Preprocessor > Meshing > Size Cntrls > ManualSize > Lines > Picked Lines





Select/Pick Lines to specify mesh size for

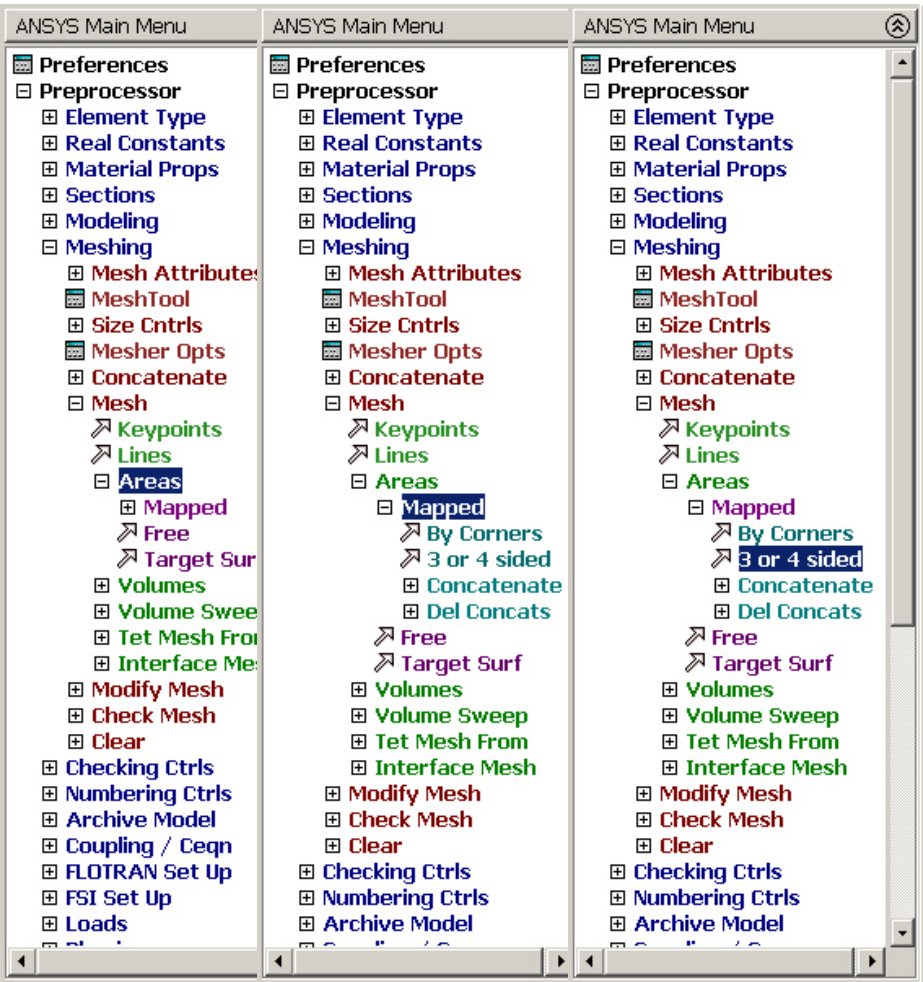
Pick L2 and L11

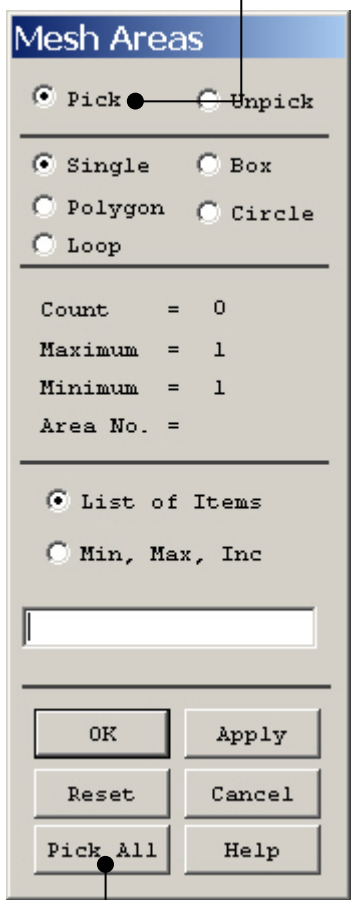
Enter 3

Press OK when finish with selection

Example – Mapped Meshing

Preprocessor > Meshing > Mesh > Areas > Mapped > 3 or 4 sided



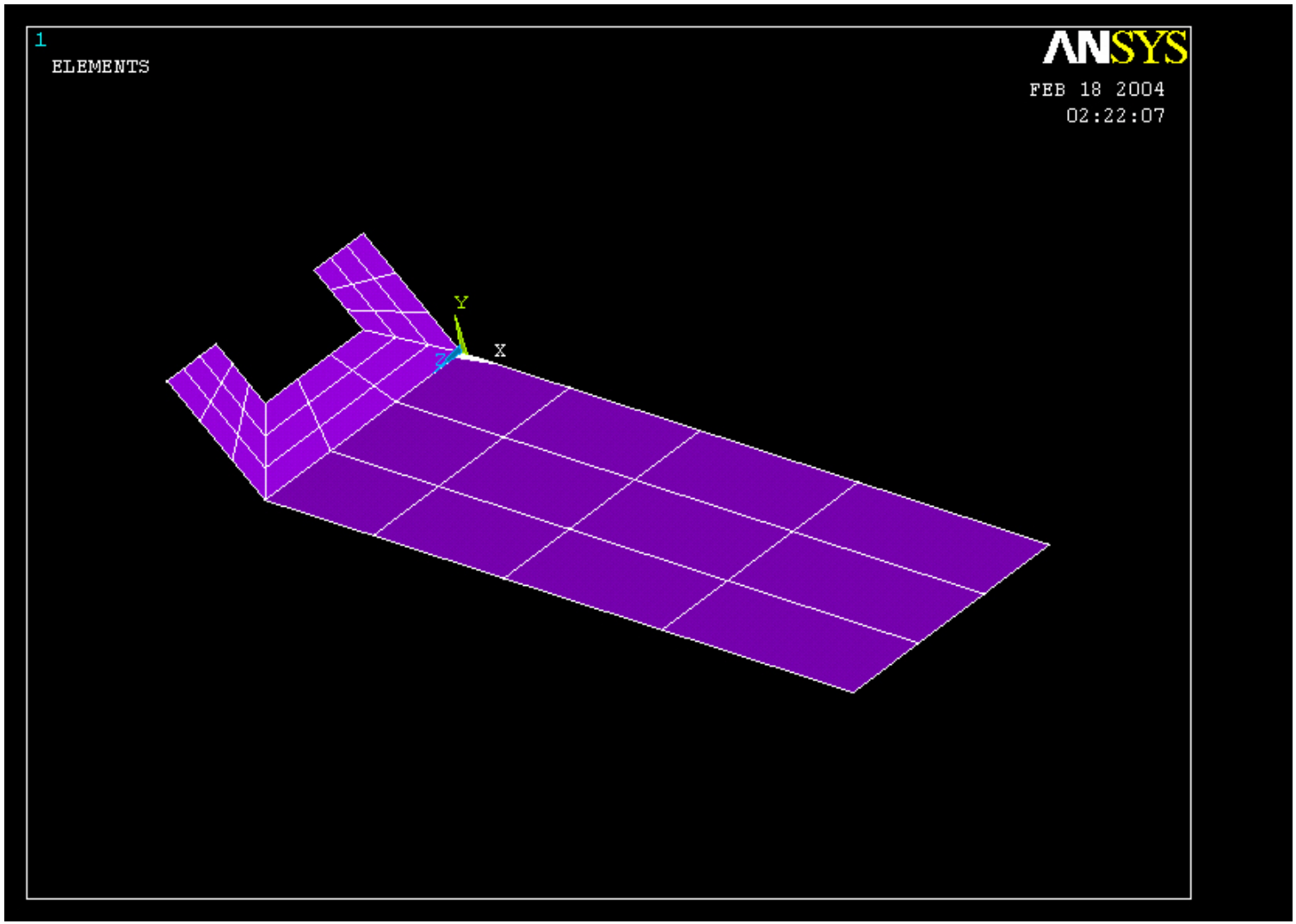


Select all areas to be meshed

NB: It is often necessary to “Clear” the model for example if Element Type or model geometry is to be changed

Select all areas defined to be meshed

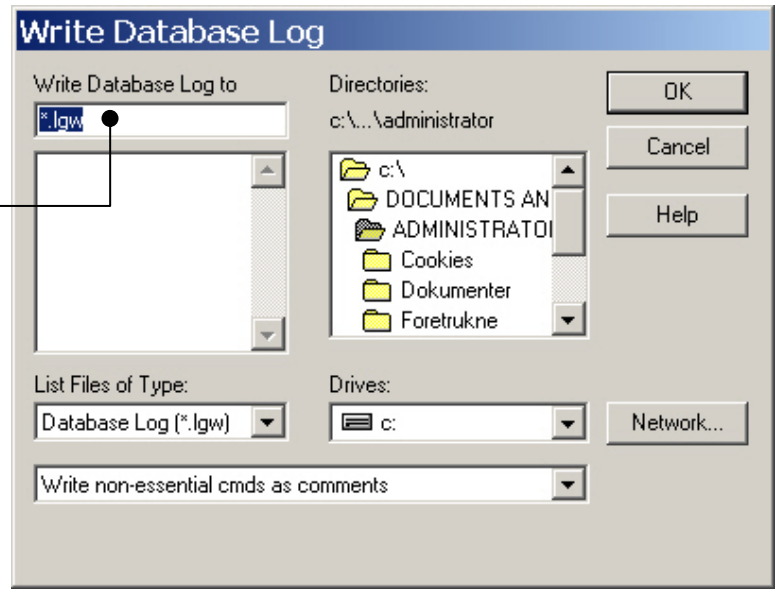
Example – Mapped Meshing



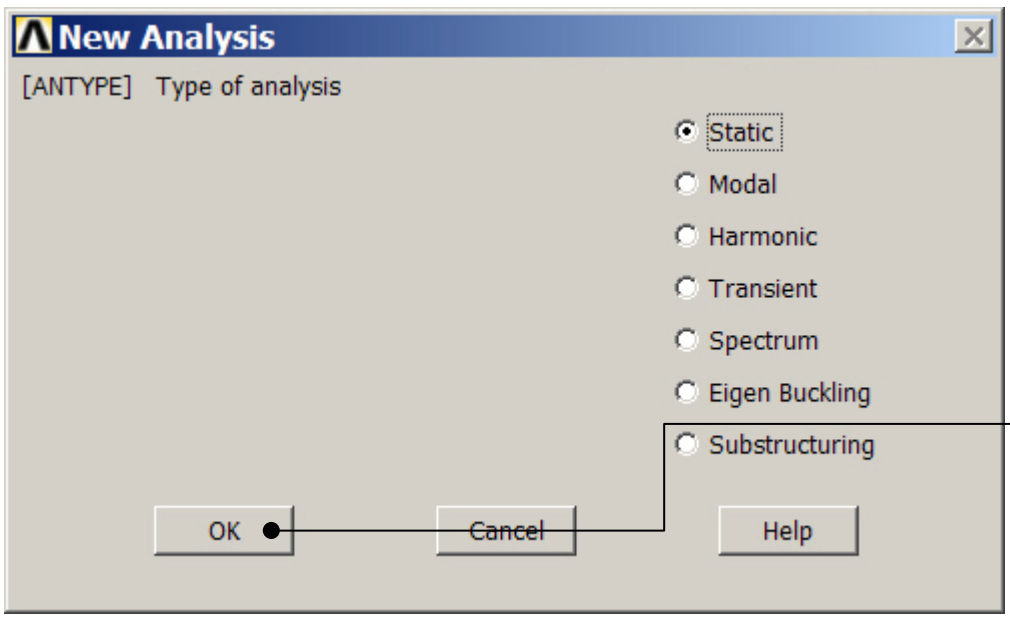
Example – Analysis Type

File > Write DB log file

Enter “example0301.lgw”

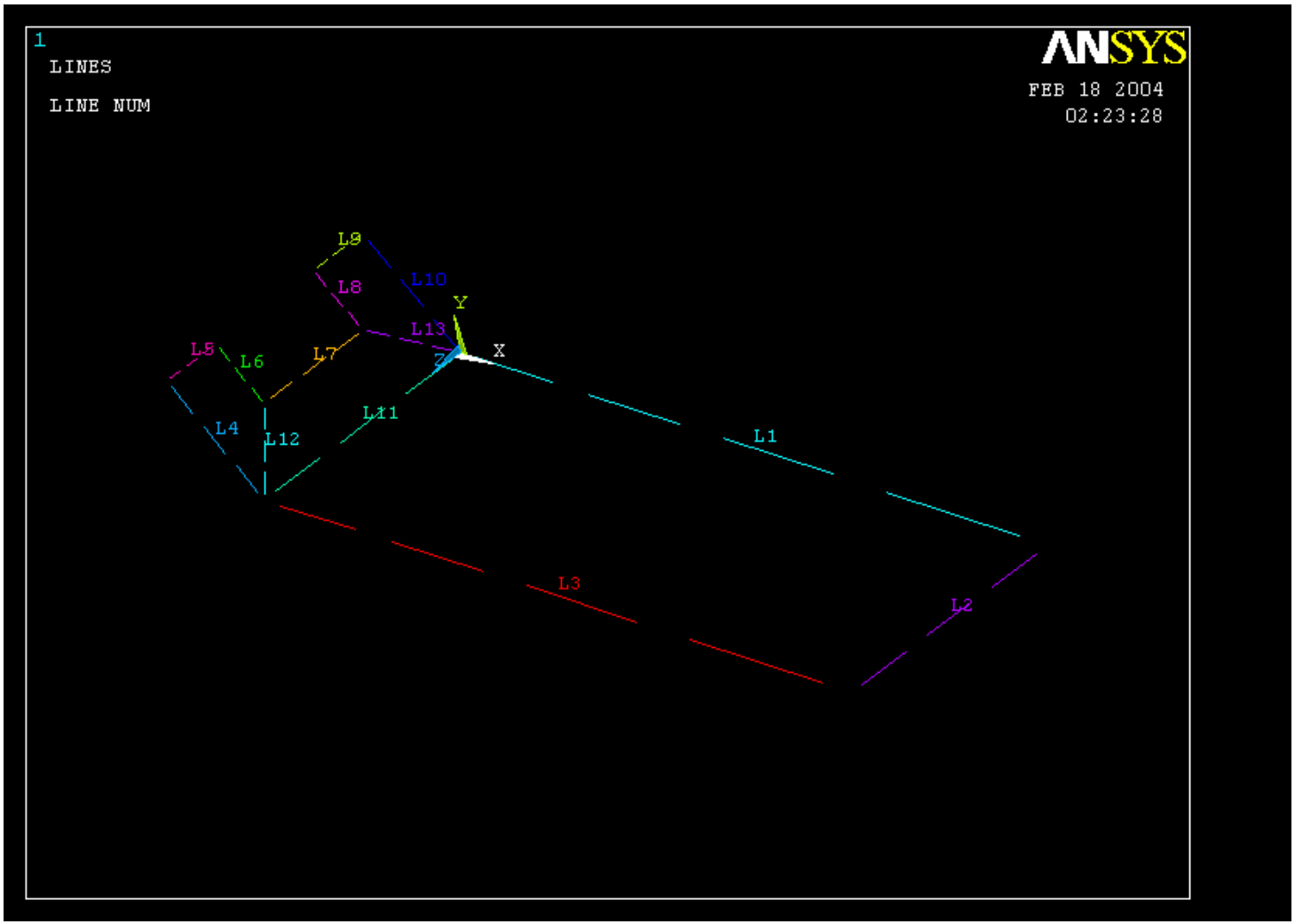


Solution > Analysis Type > New Analysis



Press OK

Example – Plot - Lines

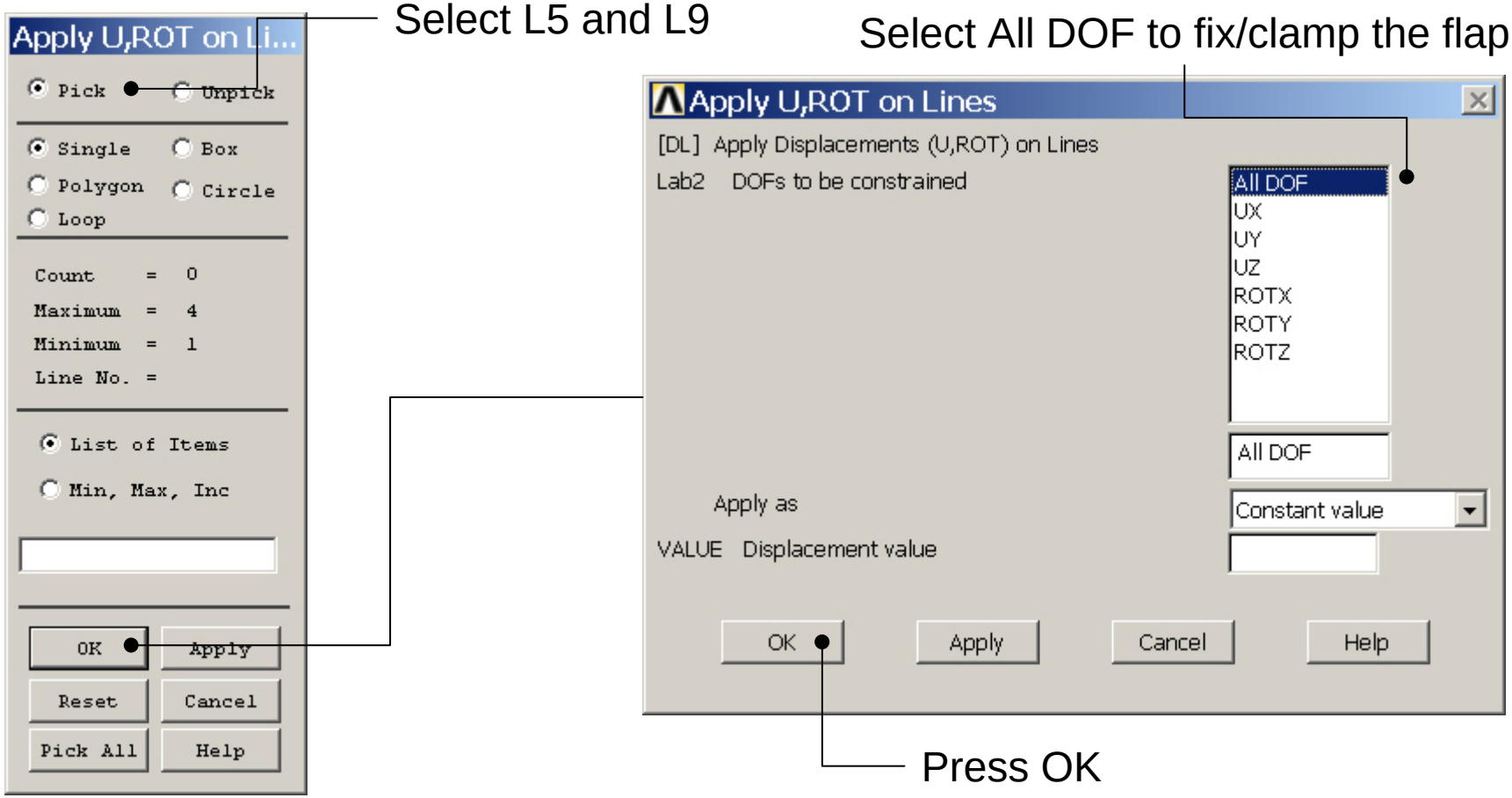


Example – Define Loads

Solution > Define Loads > Apply > Structural > Displacement > On Lines

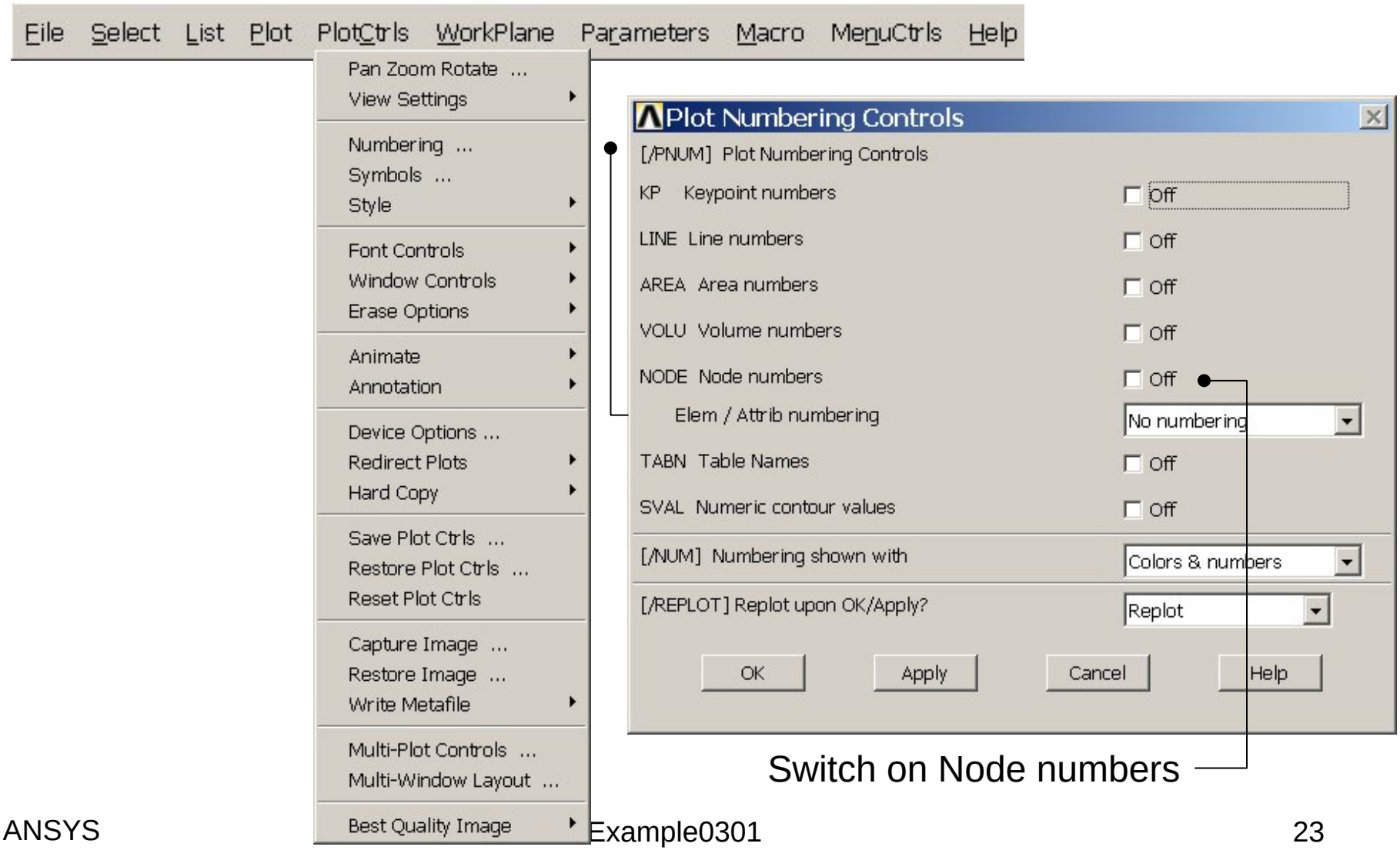
Select L5 and L9

Select All DOF to fix/clamp the flap

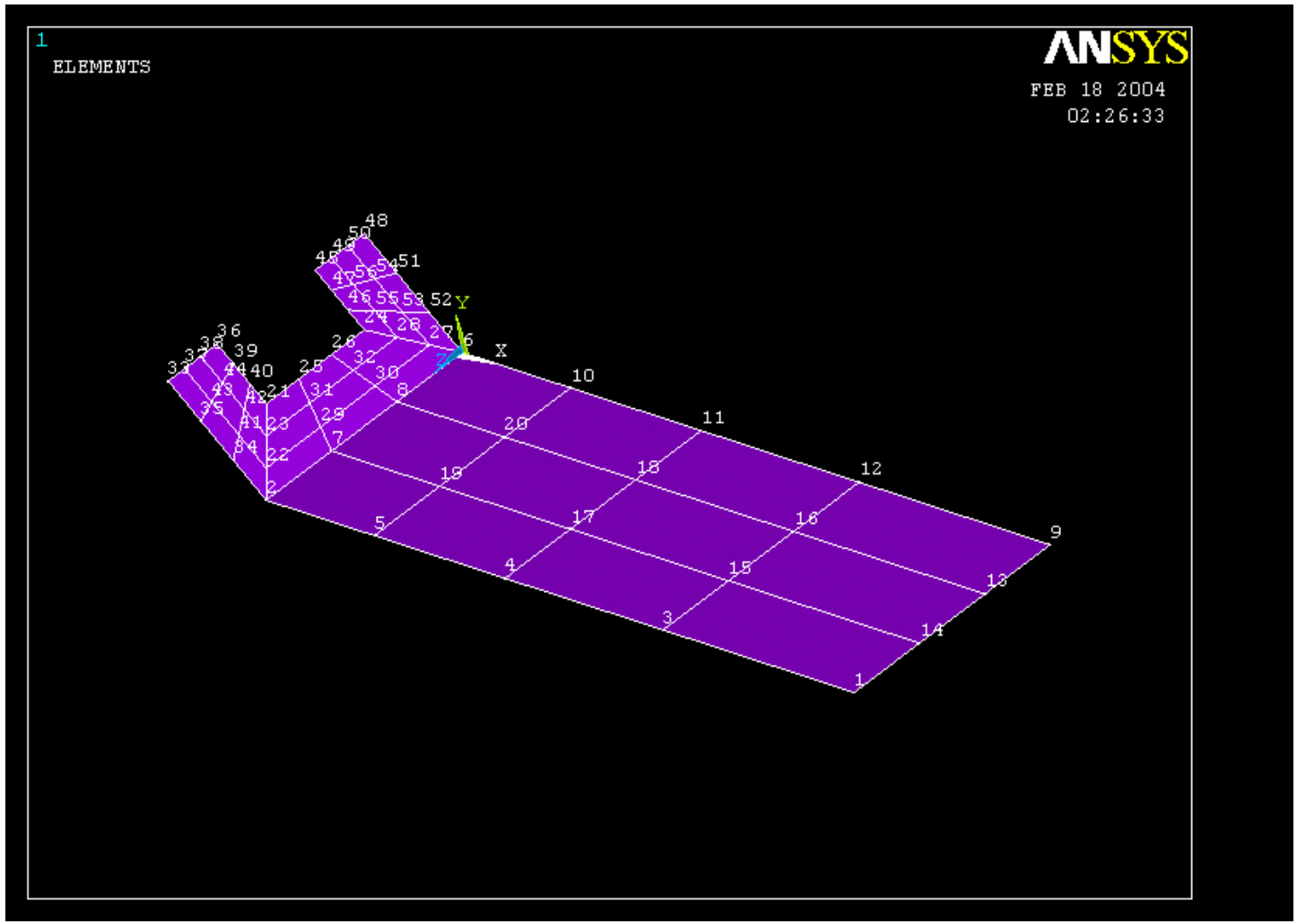


Press OK

Example – Node numbers

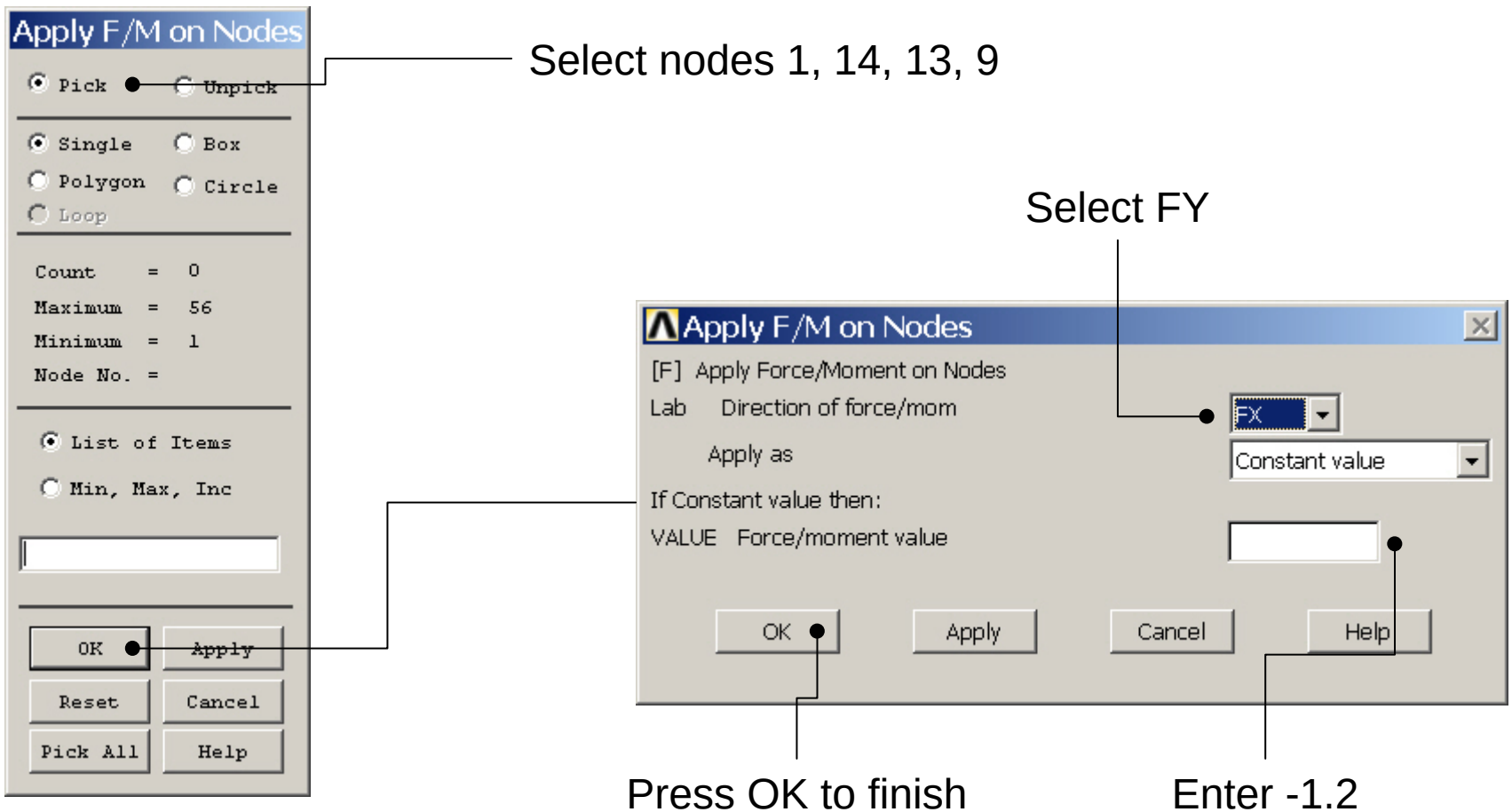


Example – Plot - Elements

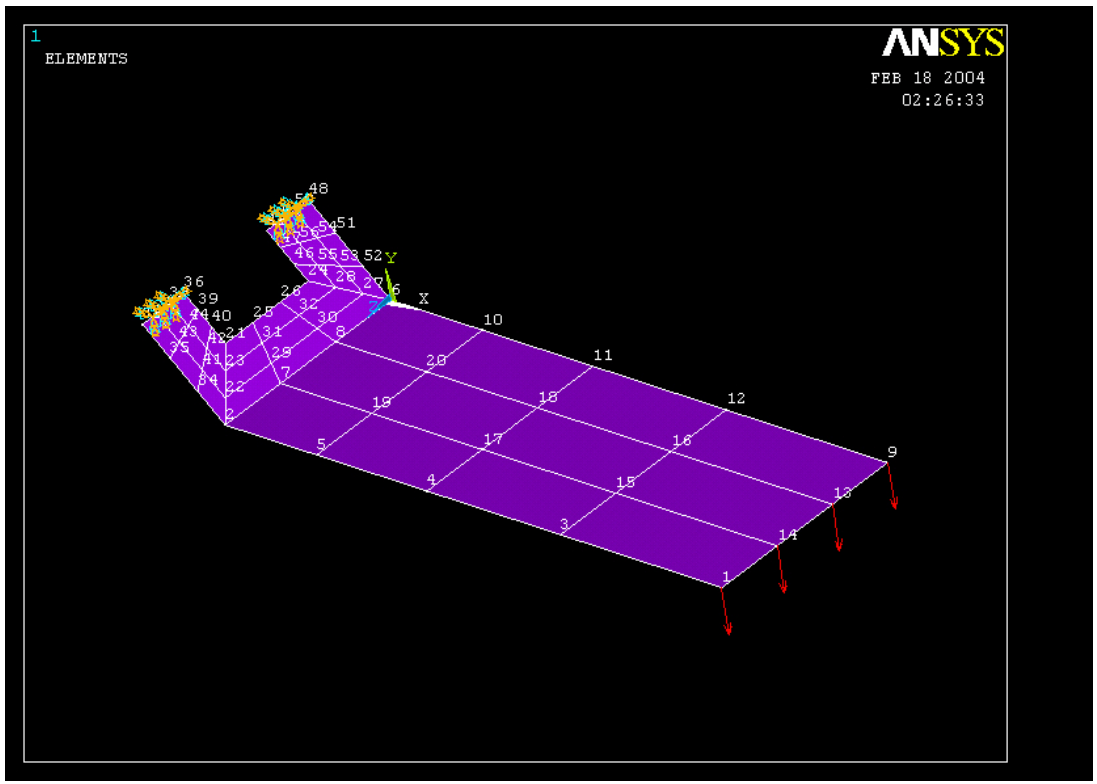


Example – Define Loads

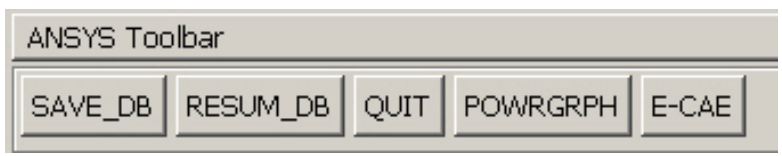
Solution > Define Loads > Apply > Structural > Force/Moment > On Nodes



Example - Save



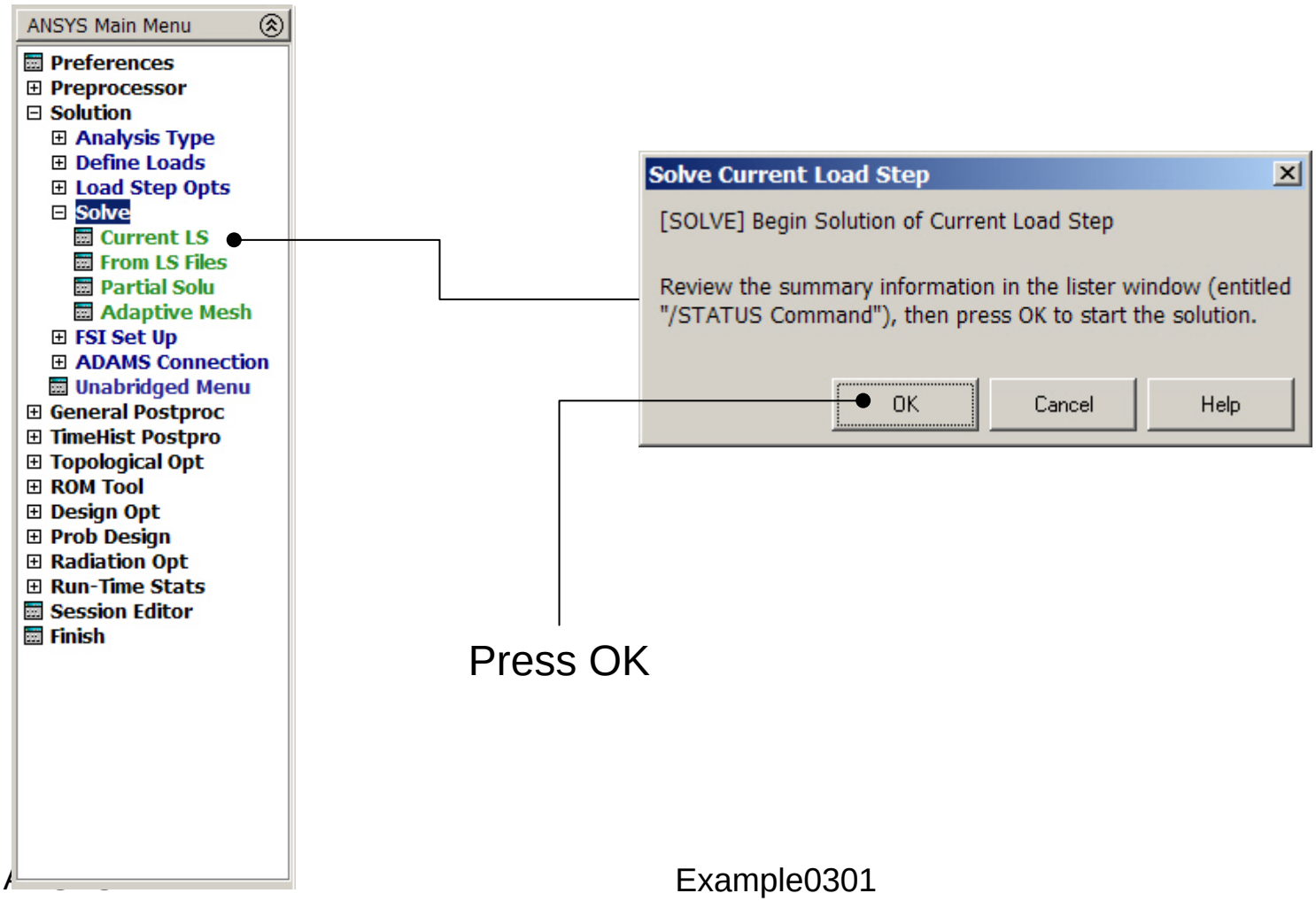
Display of Analysis model



Save the model

Example - Solve

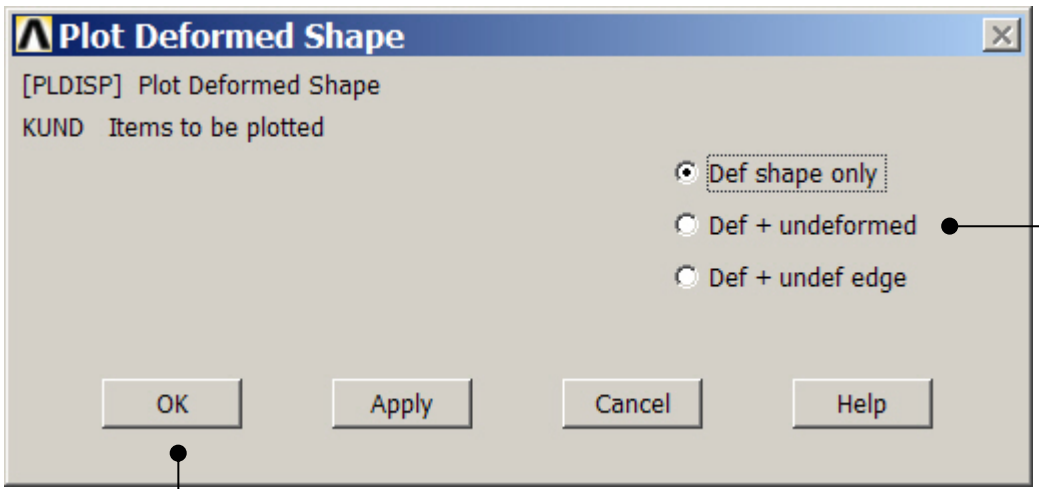
Solution > Solve > Current LS



Press OK

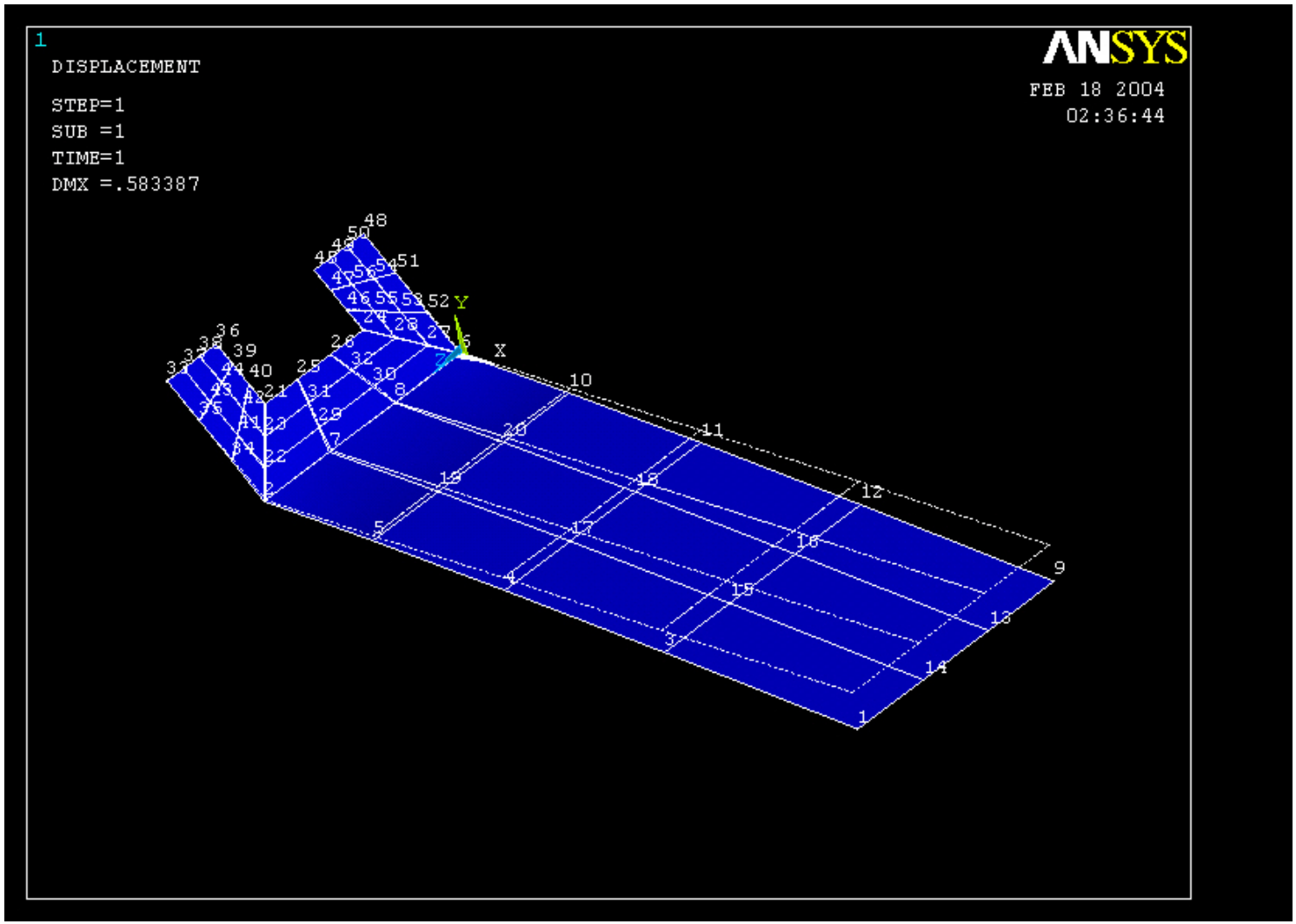
Example - PostProcessing

Solution > General Postproc > Plot Results > Deformed Shape

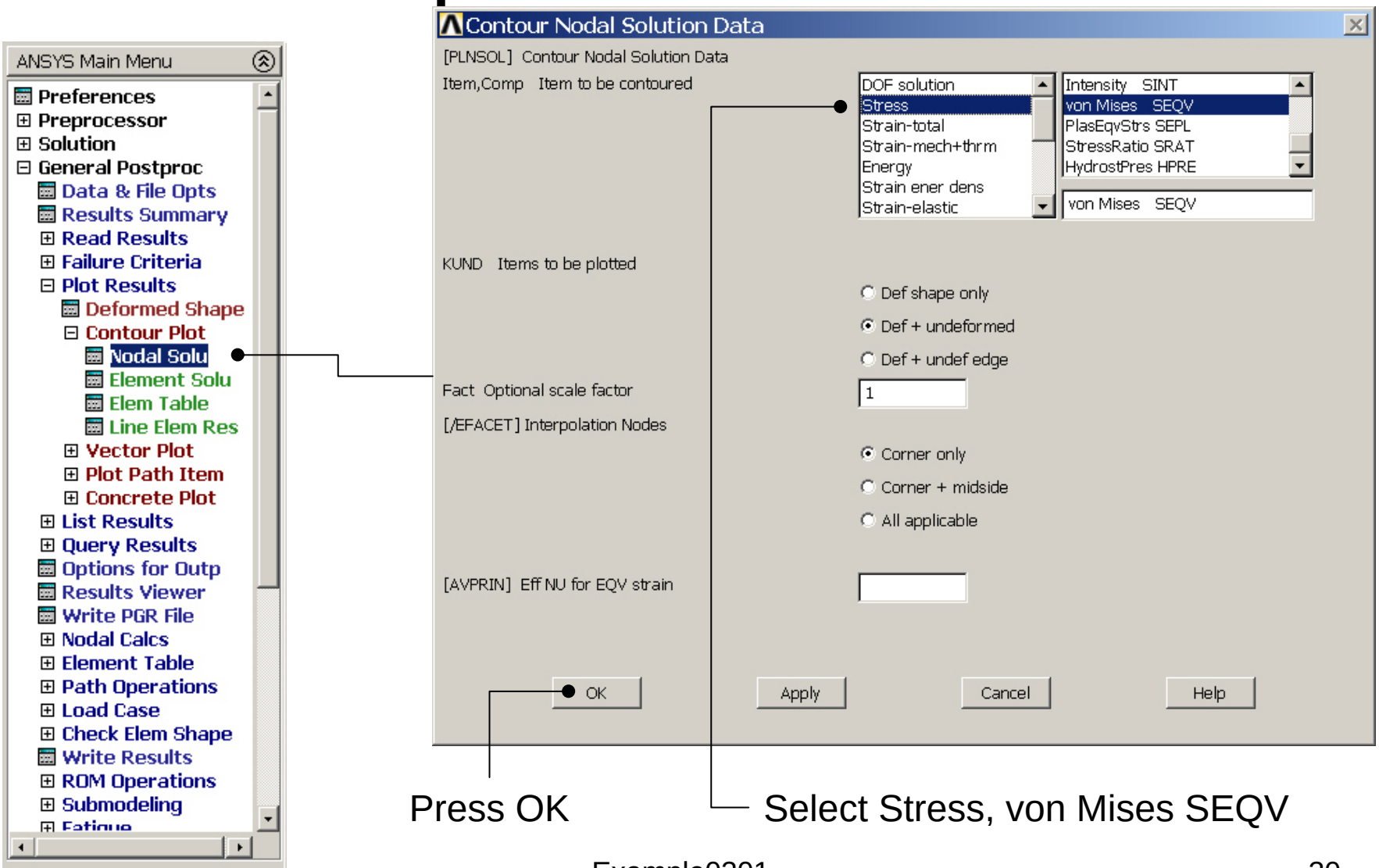


Select “Def+undeformed” and Press OK

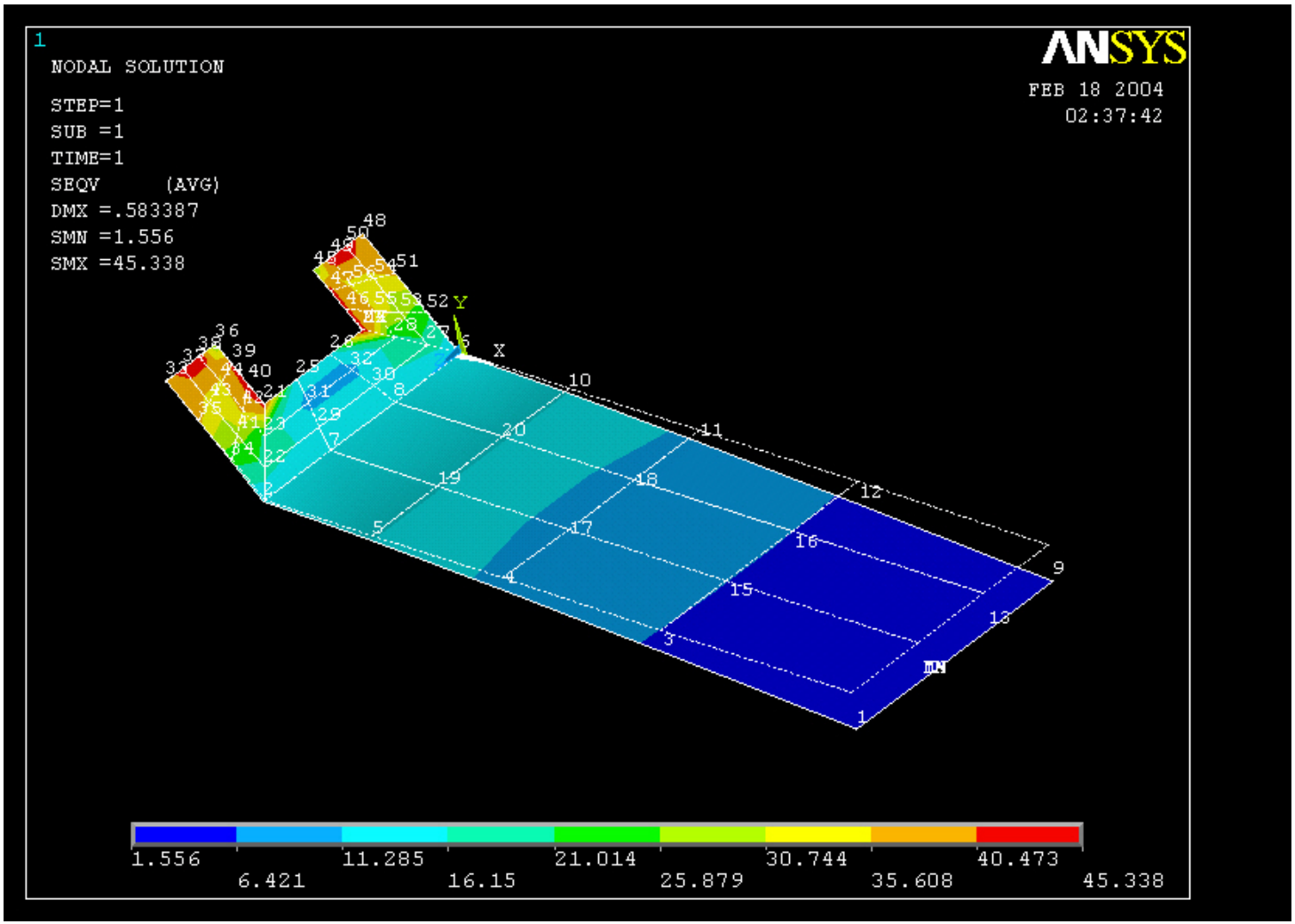
Example - PostProcessing



Example – Contour Plot



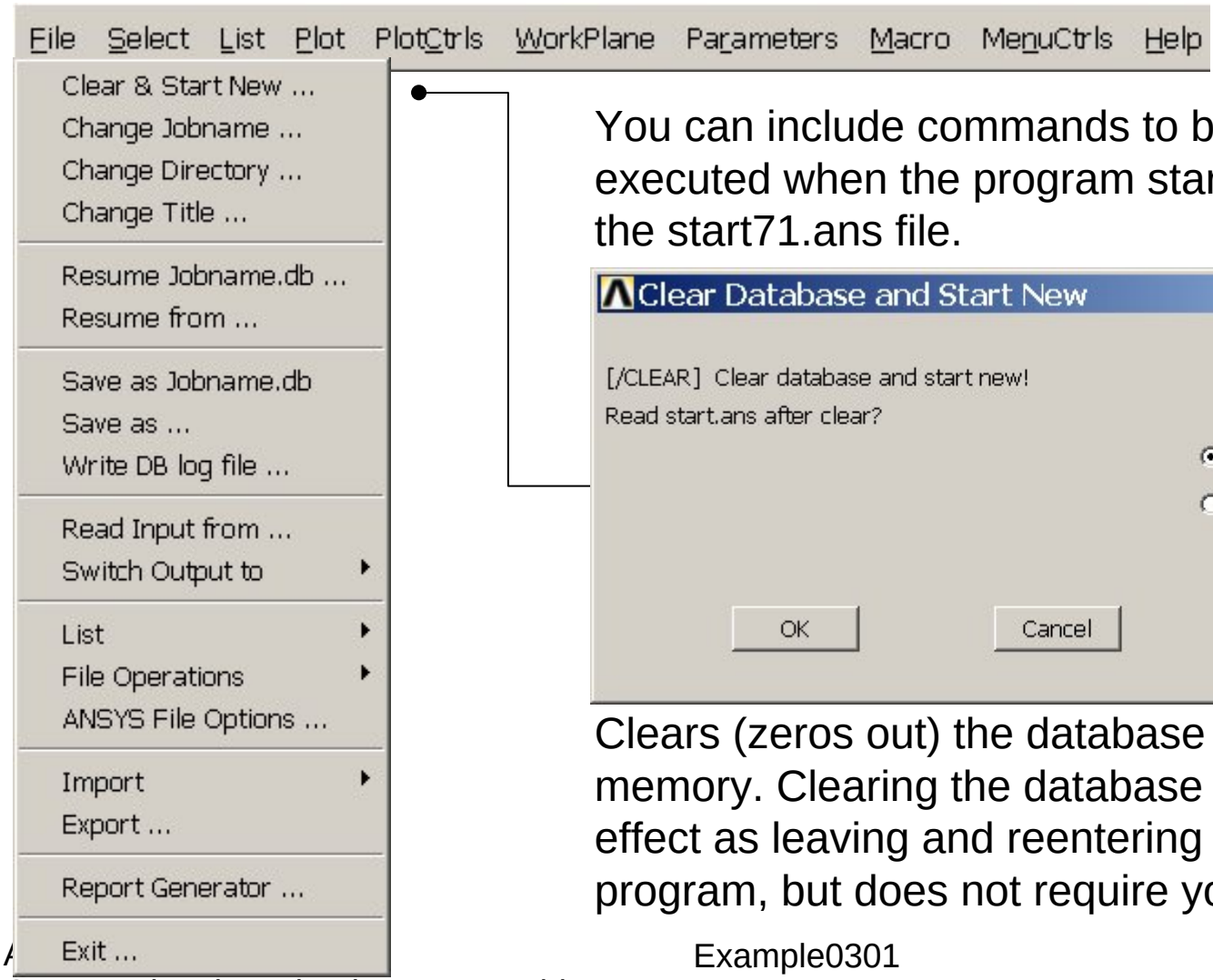
Example – Contour plot



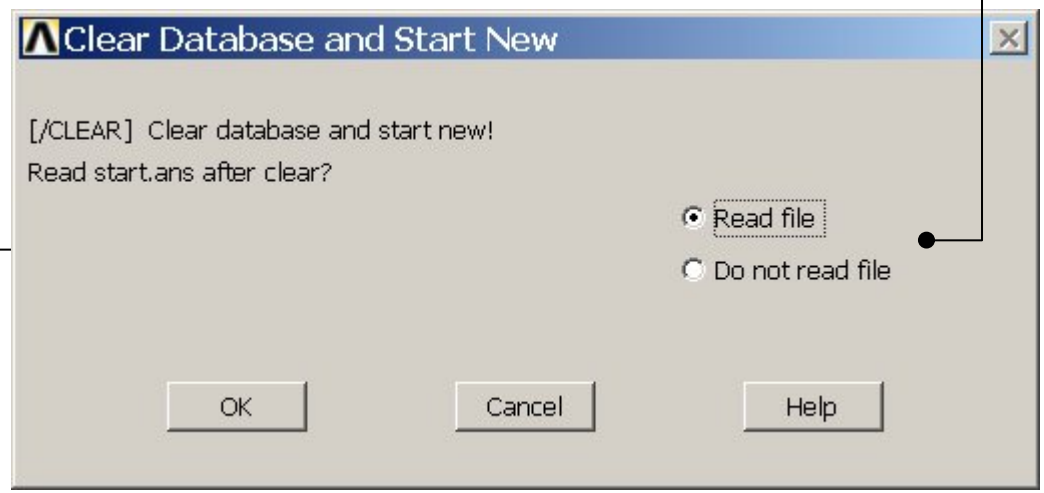
Example – Comments/Questions

- The “example0301.lgw” can be edited in “Notepad”
- Change element type to 6-noded triangular elements? Will this affect the result?
- Will the number of elements affect the solution?

File menu



You can include commands to be executed when the program starts up in the start71.ans file.



Clears (zeros out) the database stored in memory. Clearing the database has the same effect as leaving and reentering the ANSYS program, but does not require you to exit.