

Steps for the one-D link-element model:

Model Development:

ansys -g -j 1Dlink &

1. Set Preference:

Preferences - Structural = on - OK

2. Key Points:

Preprocessor - Modeling>Create - Keypoints - In Active CS
Keypoint number = 1, X,Y,Z = 0., 0., 0. -- > Apply
Keypoint number = 2, X,Y,Z = 12., 0., 0. -- > Apply
Keypoint number = 3, X,Y,Z = 24, 0., 0. -- > OK

3. Lines:

Preprocessor - Modeling>Create - Lines/lines - Straight line
Now left click points 1 and 2;
Then left click points 2 and 3;
-> Cancel

4. Define materials

Preprocessor - Material props – Material models – Structural
- Linear – Elastic – Isotropic
Young's modulus EX = 30e6
Poisson's ratio PRXY = 0.0

- Density

Density DENS = 0.2836
OK

Material - Exit

5. Select Mesh Type:

Preprocessor - Element Type - /Add/edit/Delete - Add
Select "Structral Link" and "2D Spar 1"
OK
Close

Preprocessor - Real Constants - /Add/edit/Delete - Add - OK
AREA=5.25, ISTRN=0.0 - OK

- /Add/edit/Delete - Add - OK

Set No = 2, AREA=3.75, ISTRN=0.0 - OK - Close

PlotCtrls/Numbering - KP=on, LINE=on - OK
Plot / Lines

6. Meshing:

Preprocessor - MeshTool -
Set - Real constant set number = 1 - OK
Size controls - lines/Set - pick the first link
- NDIV = 1 - OK
Mesh - pick the first link - OK

Utility Menu: Plot - Lines

Set - Real constant set number = 2 - OK
Size controls - lines/Set - - pick the second link
- NDIV = 1 - OK
Mesh - pick the second link - OK

Utility Menu:

List/Elements/Nodes+attr+RealConst

Close (To double-check what you did.)

7. Apply BCs and loads:

Solution -Loads/Apply - Displacement - On nodes

Pick Node 1 - OK - Lab2 = All DOF & Value =0.0 - OK

Solution -Loads/Apply - Force/Moment - On nodes

Pick the 2nd node

OK

Lab = FX, Value = 100 - OK

Solution -Loads/Apply - Gravity

ACELX= - 1.0, ACELY=0.0, ACELZ=0.0

(Note the gravity is treated as acceleration force, so the force is opposite to the direction of gravity)

OK

8. Solve:

Solution - Solve/Current LS - OK - Close - Close

9. See the solution:

General Postproc - List Results - Nodal Solution
OK

You should see the following results:

Node	Vx	Vy
1	0.	0.
2	0.92720e -5	0.
3	0.99527e -5	0.