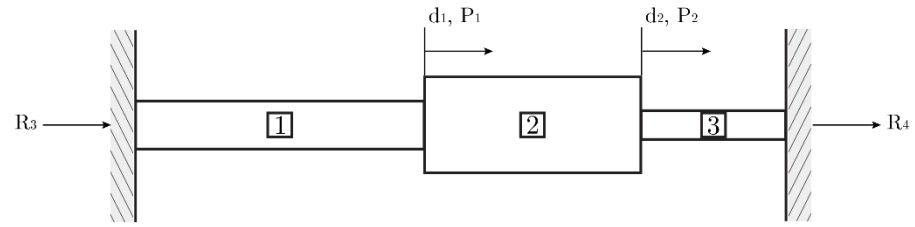
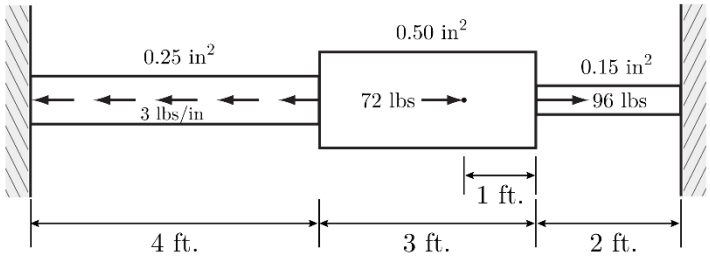
Uniaxial Bar Analysis Walkthrough using SAP2000 (Part II)

CE 525 – Advanced Structural Analysis

North Carolina State University

PART II





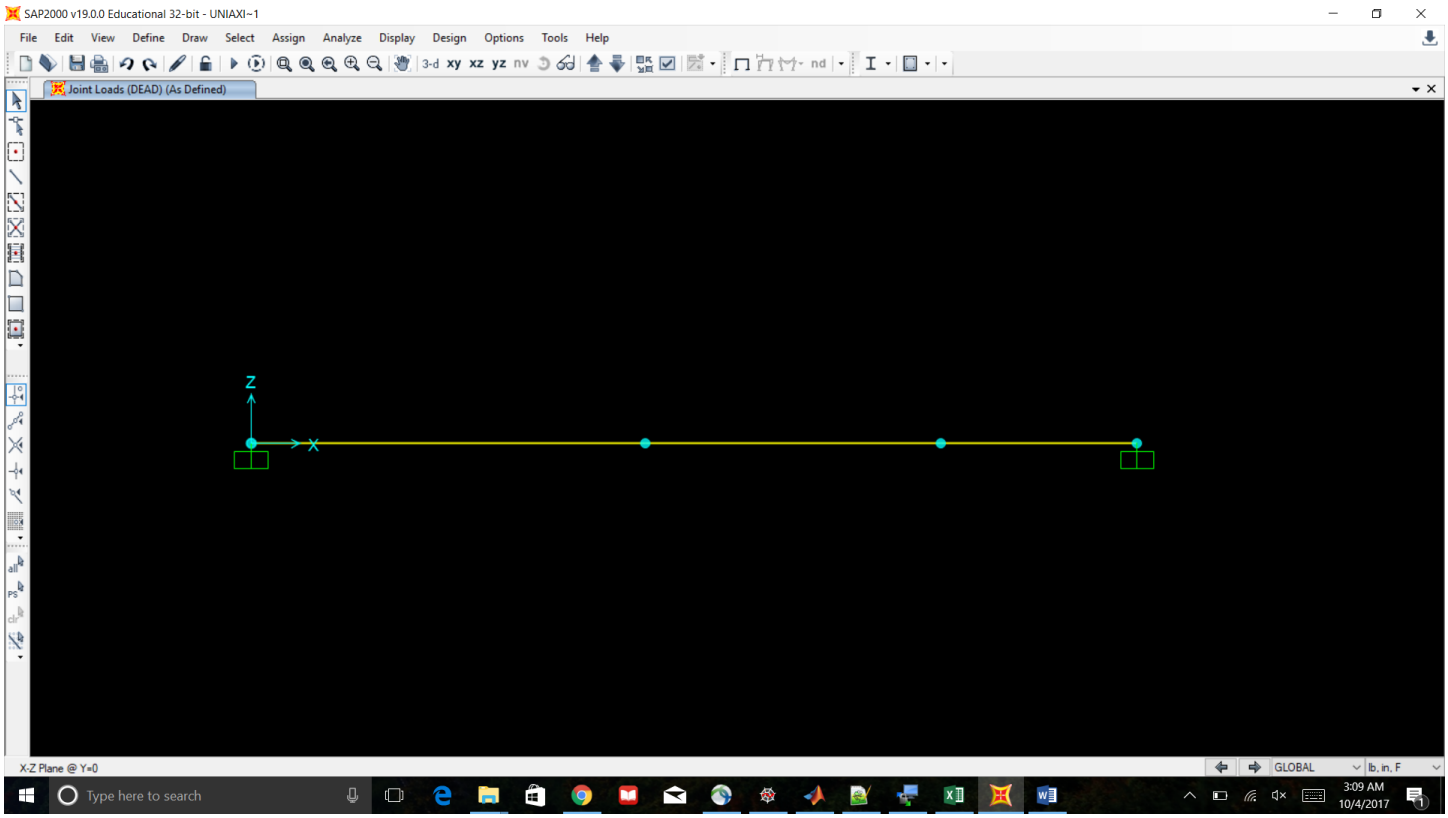
E = 30e3 ksi (all members)

Uniaxial Bar Analysis Walkthrough

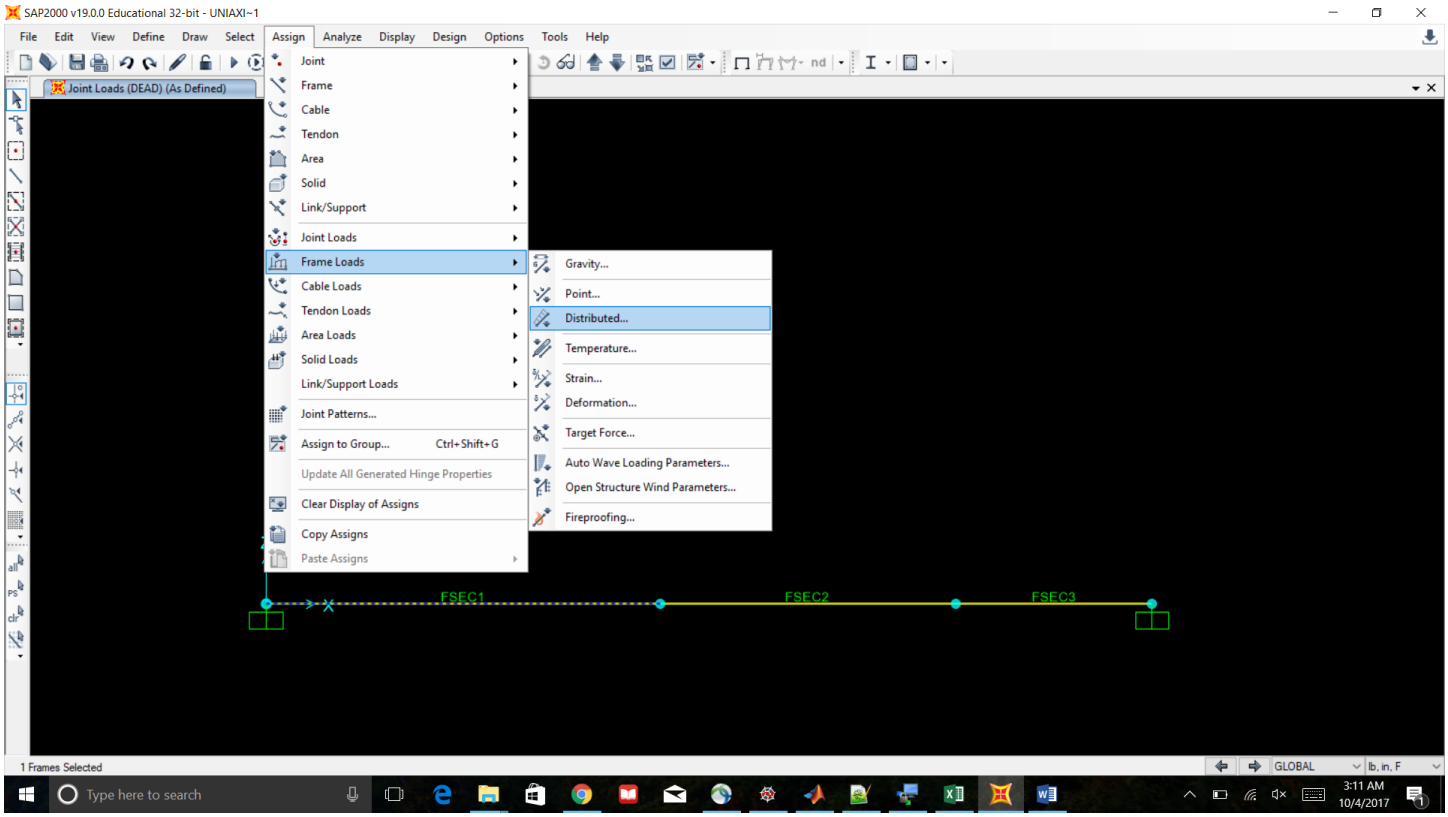
Reference: Uniaxial Example Problem Part II

Picking up from Part I where we assigned joint loads to uniaxial bar. Now we will learn how to assign member loads.

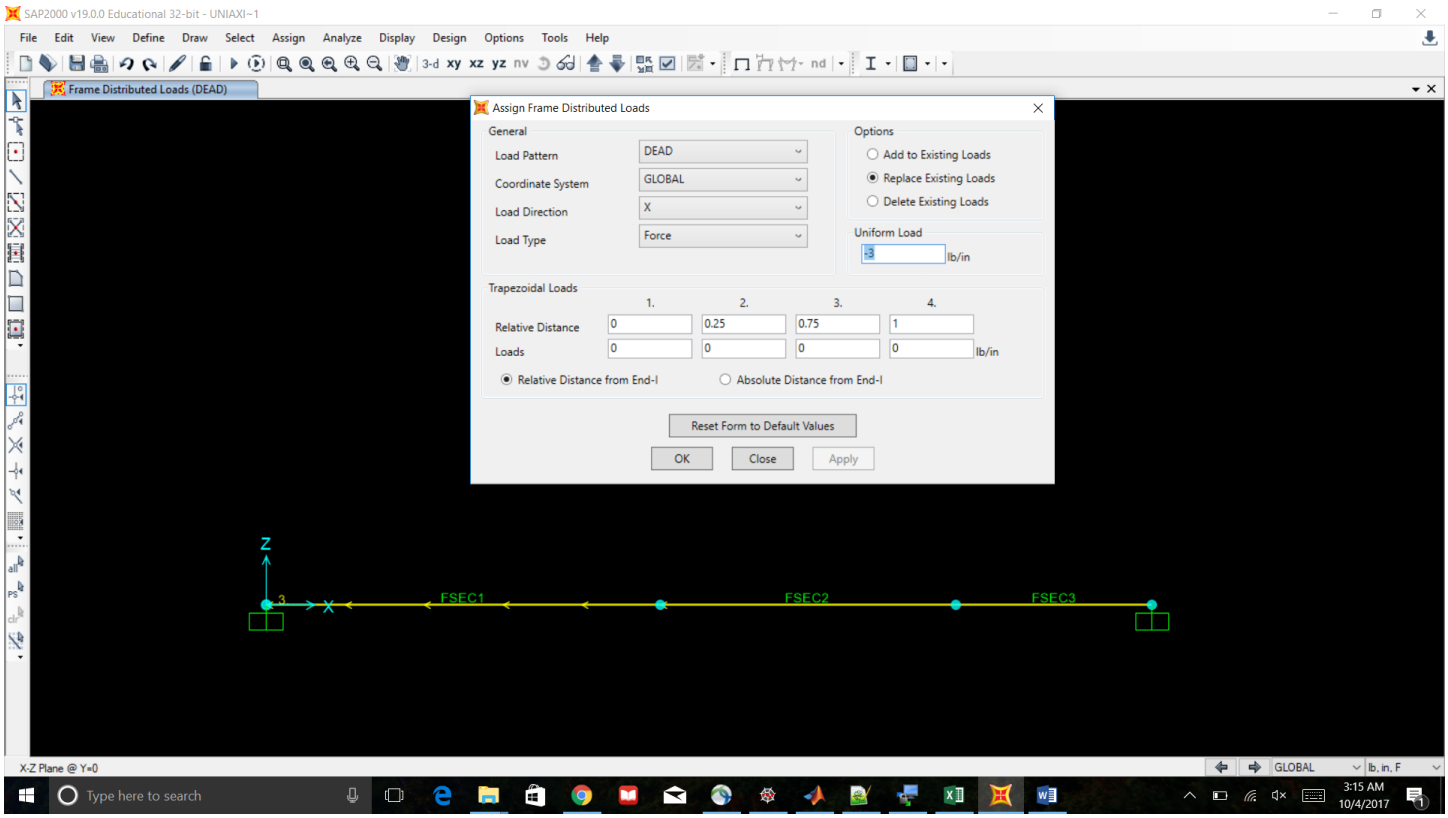
Start with the system created in Part I, but with no assigned loads. (Part I pg. 15)



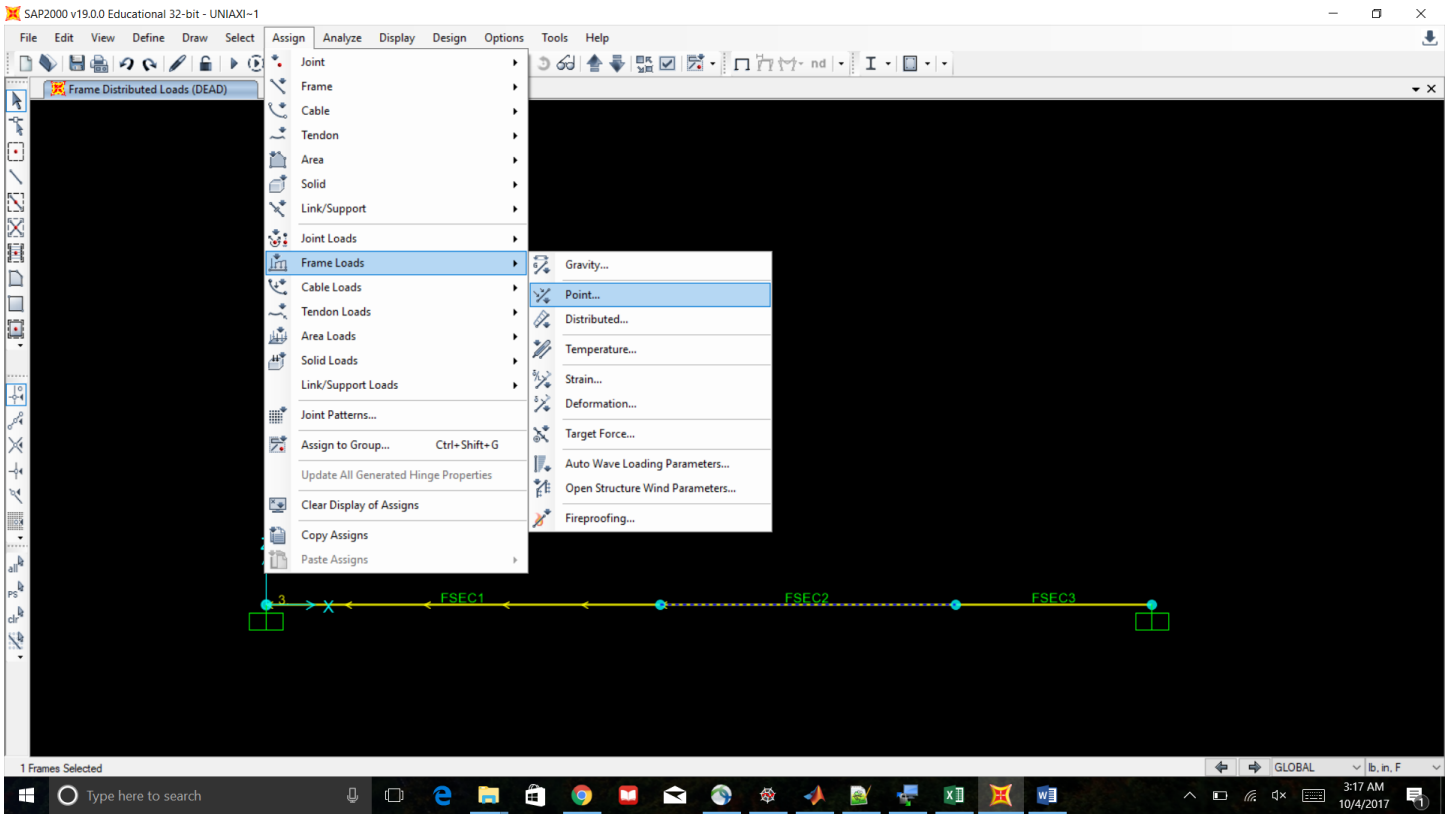
Select Member 1. Click “Assign” -> “Frame Loads” -> “Distributed”



Assign a uniform load of -3 lb/in in the GLOBAL X direction. Click ok.

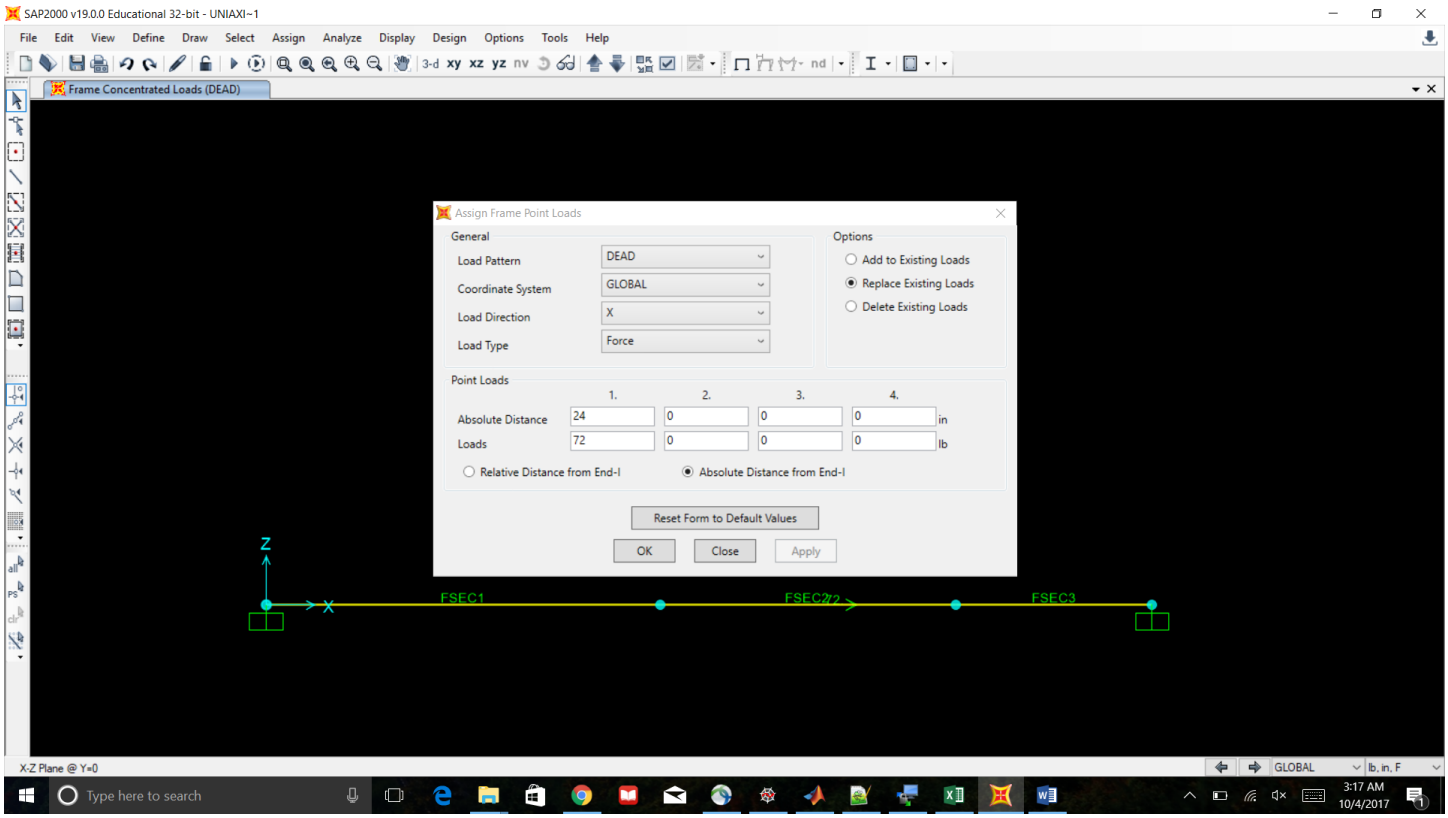


Select Member 2. Click “Assign” -> “Frame Loads” -> “Point”

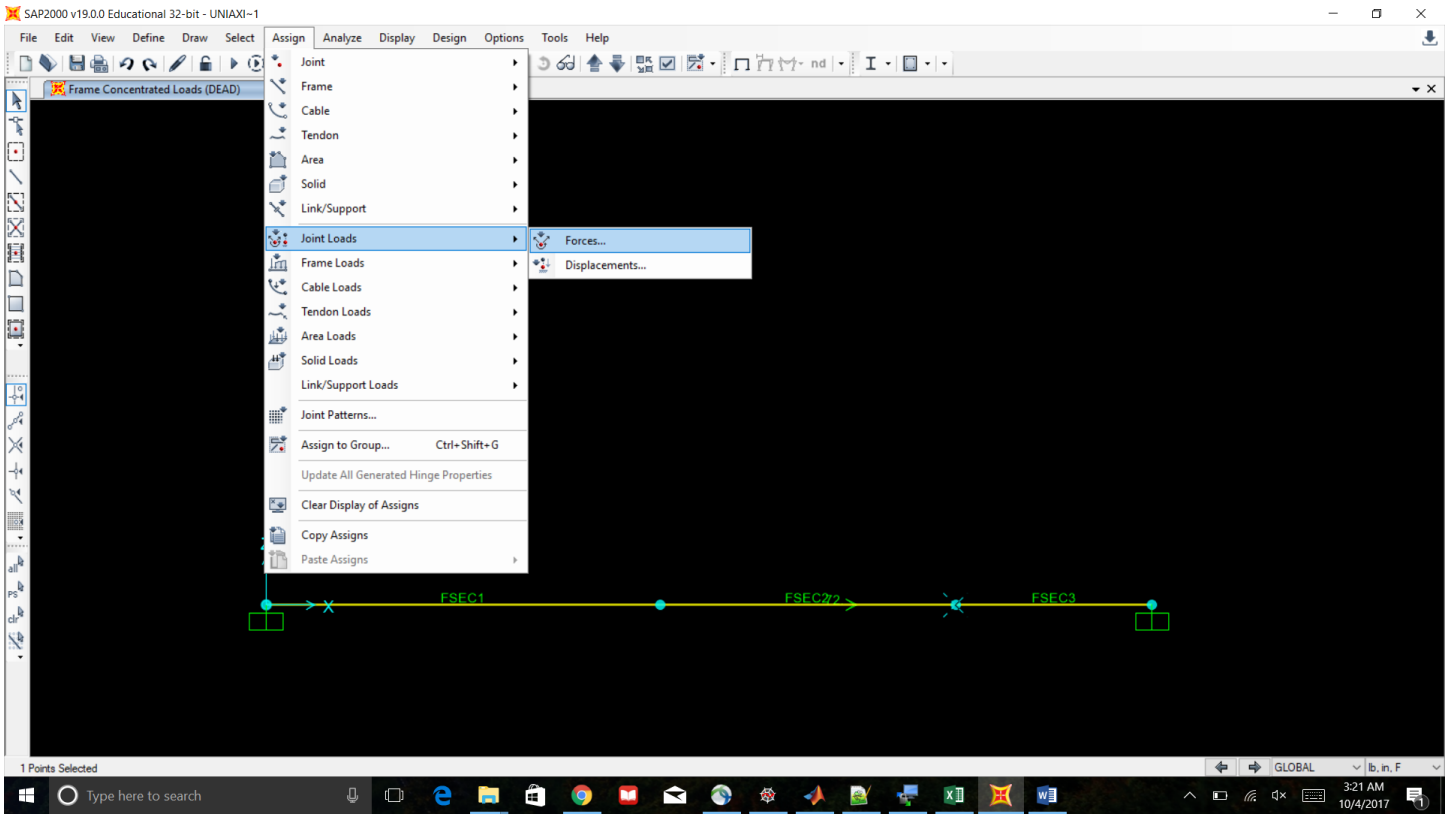


Select “Absolute Distance from End-I”

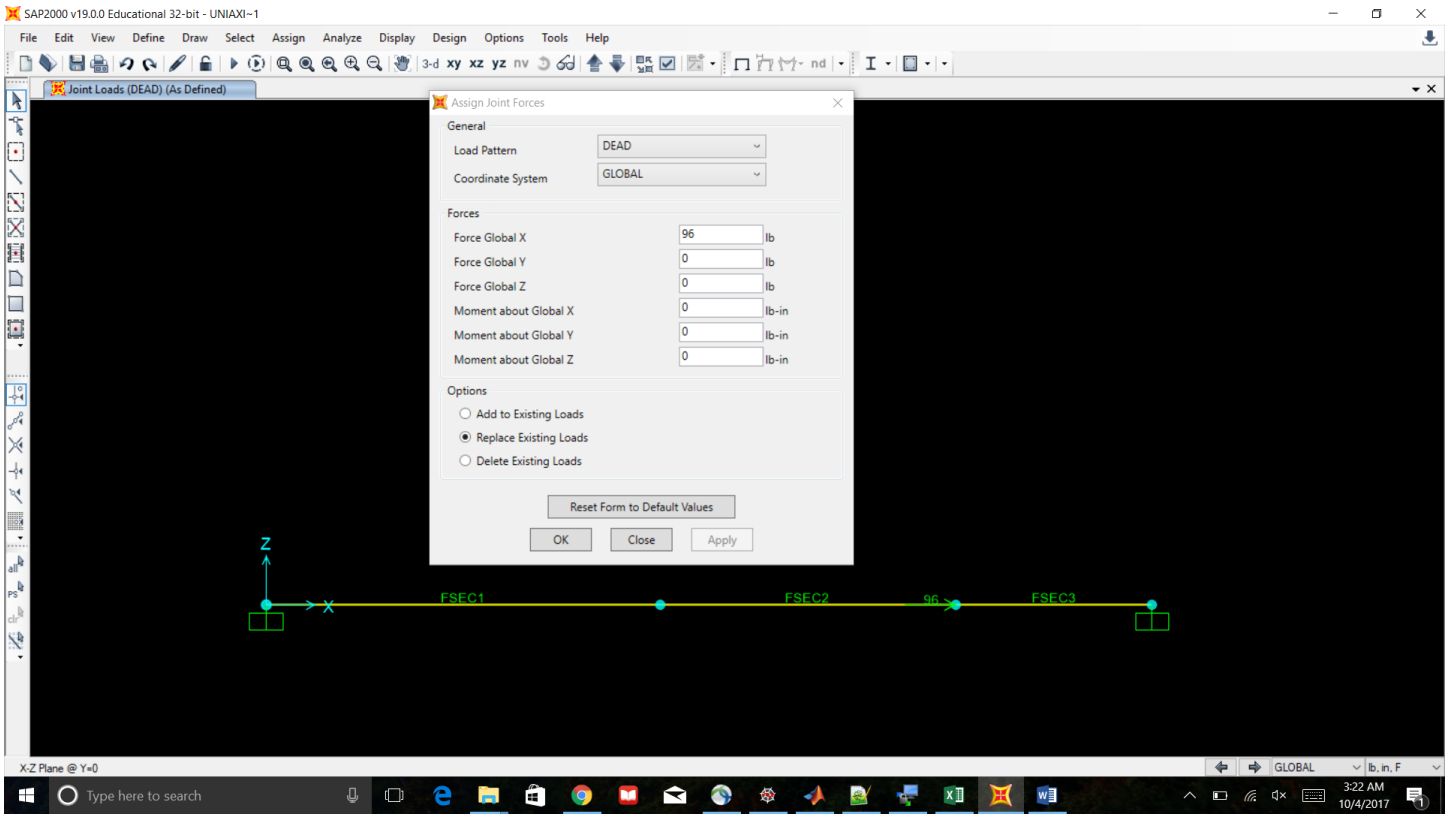
Assign a point load of 72 lbs in the GLOBAL X direction at an absolute distance of 24 in.



Select Joint 3. Click “Assign” -> “Joint Loads” -> “Forces”



Assign a force of 96 lbs in the Global X direction. Click ok.



Ensure that the proper analysis parameters are set as described in the Part I tutorial.

Run the Analysis for the DEAD load case.

You may note that the displacements are equivalent to those in Part I. This is because the member loads in Part II were specifically chosen to produce the same forces at the DOFs as Part I. However, the member forces are different due to the fixed-end forces.

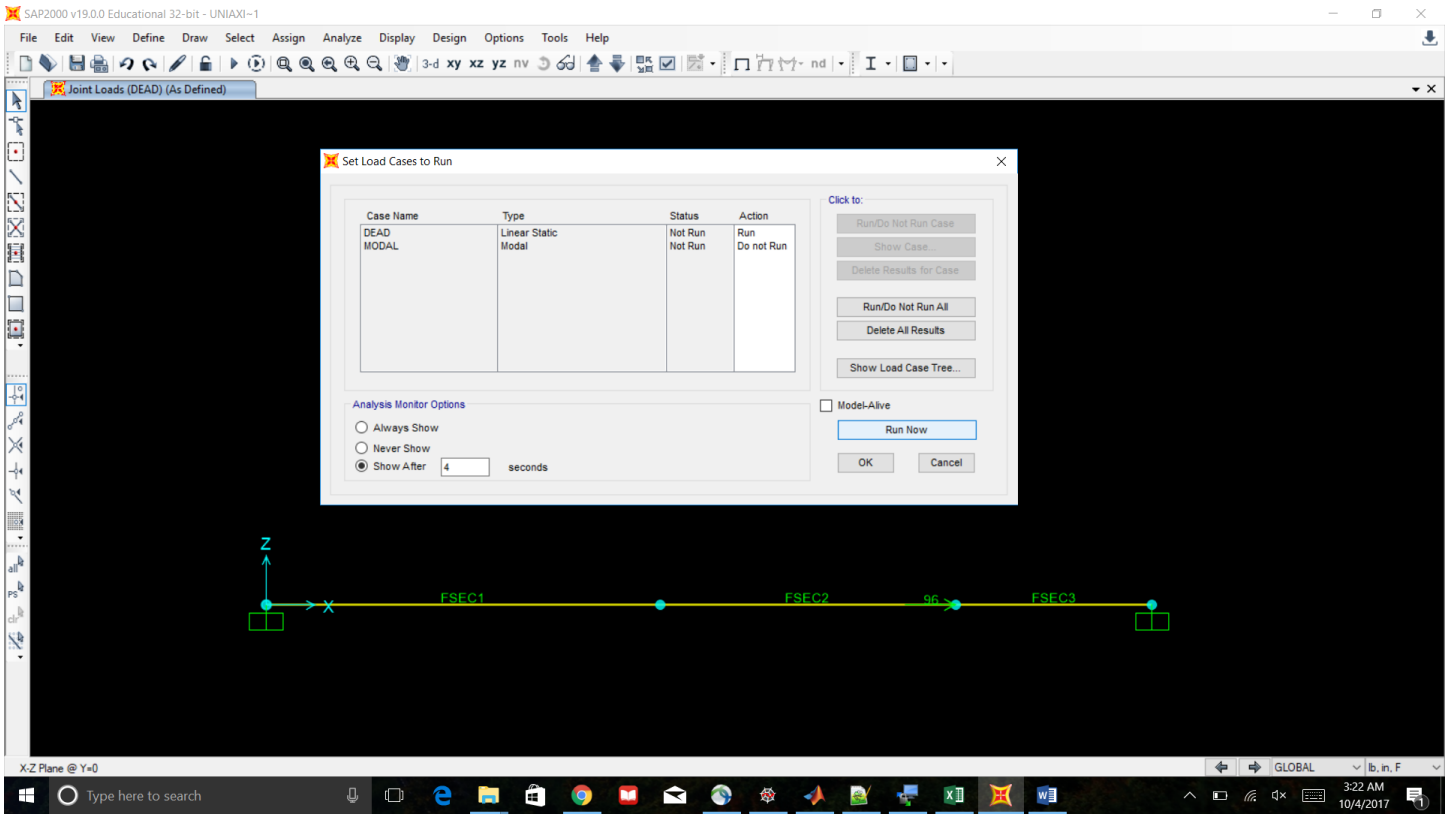
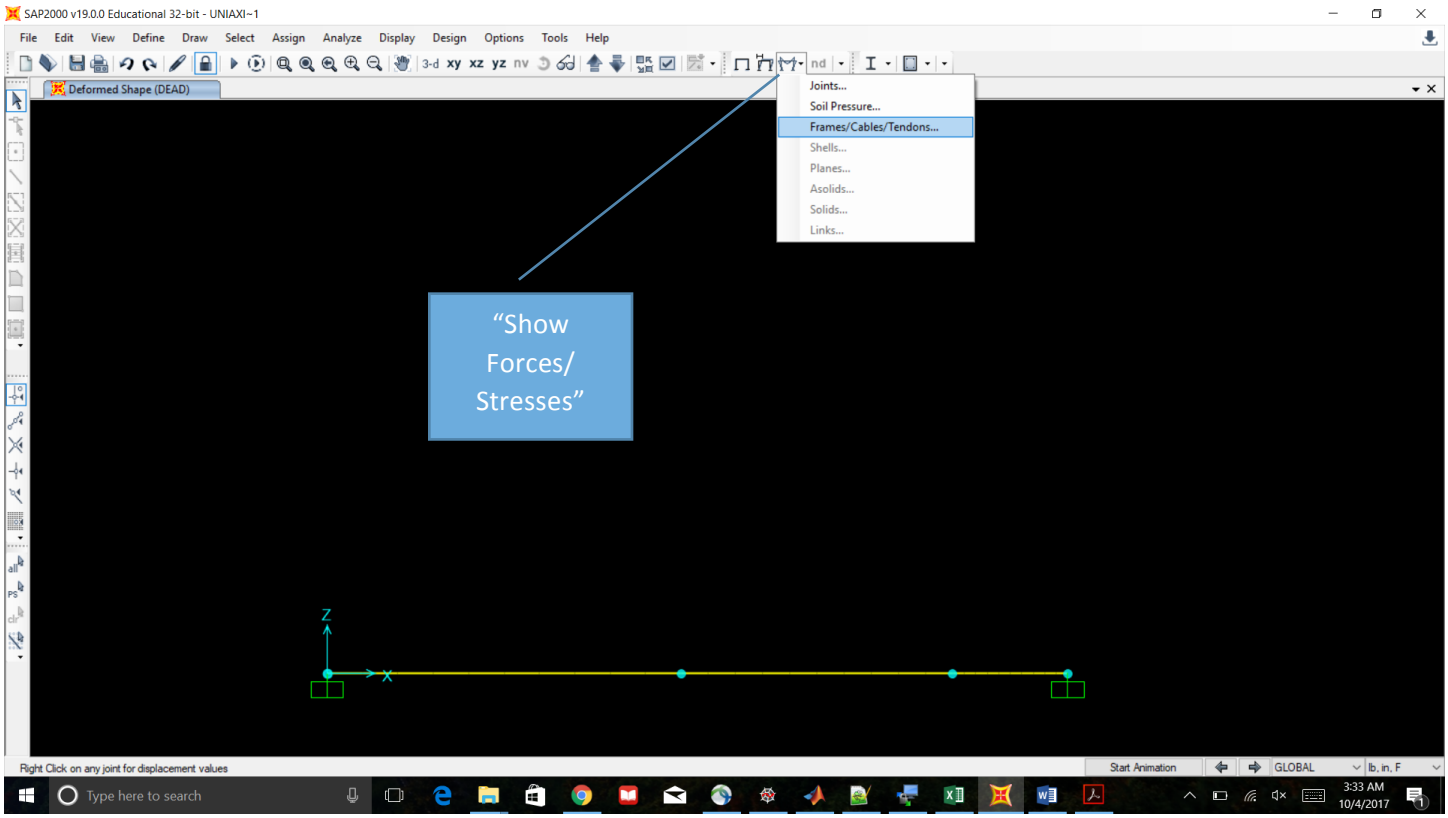


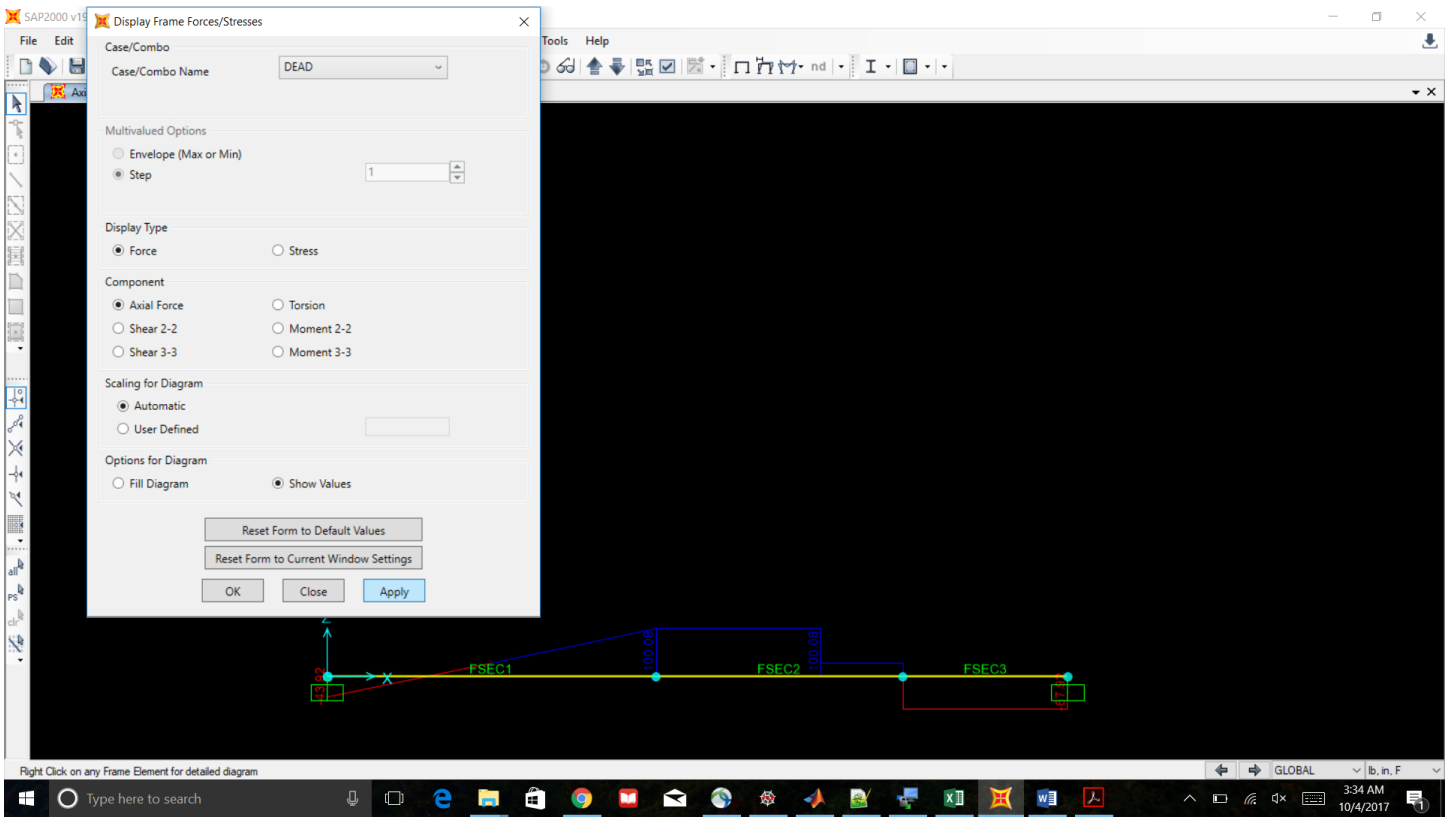
TABLE: Joint Displacements

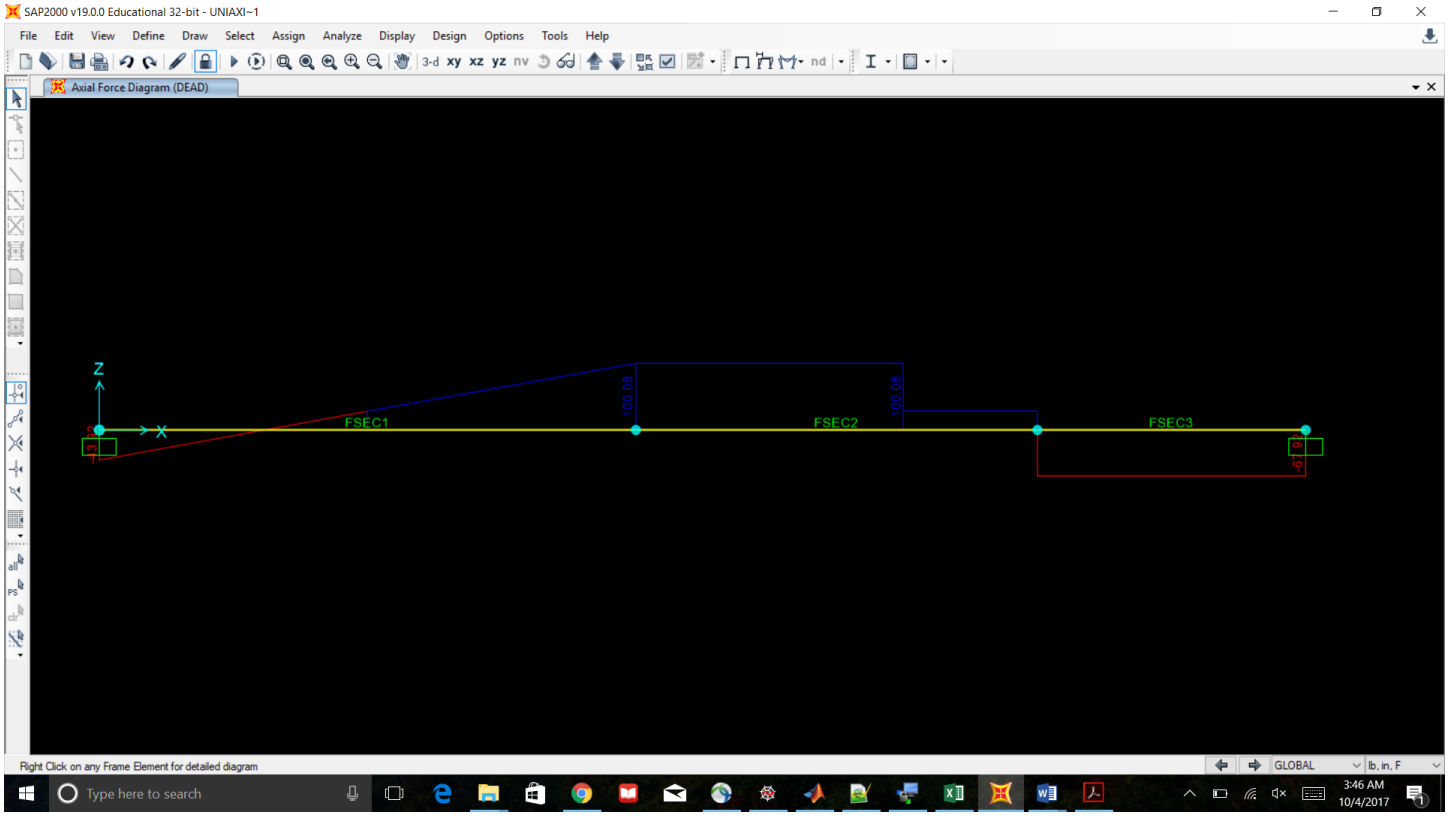
Joint	OutputCase	CaseType	U1	U2	U3	R1	R2	R3
Text	Text	Text	in	in	in	Radians	Radians	Radians
1	DEAD	LinStatic	0	0	0	0	0	0
2	DEAD	LinStatic	0.00018	0	0	0	0	0
3	DEAD	LinStatic	0.000362	0	0	0	0	0
4	DEAD	LinStatic	0	0	0	0	0	0

Click “Show Forces/Stresses” -> “Frame/Cables/Tendons”



Select "Axial Force". Select "Show Values". Click ok.





Analysis results can be tabulated and displayed as shown in Part I.