

Convert the static 2/3-D truss analysis program to dynamics, including:

1. Nonlinear geometry (already should be in static version, as converted in HW11)
2. Elasto-plastic member response (already should be in static version, as converted in HW11)
3. Newmark integration of the equations of motion (with Newton iteration to satisfy the nonlinear equations).
4. A sinusoidal forcing function with the ability to place the load at any node (or at multiple nodes through a constant shape vector for the forces).
5. Initial displacements in the form of eigenvectors of the structure.
6. Earthquake input motion (optional)

Debug and verify your program on a simple structure that you understand well. Then use the program to investigate the dynamic response of a significantly complex three dimensional structure or your own making (please, no unstable structures!). Let me know if you want to implement an animation of the response of the structure. I can help you with the code.

This program and the studies with it represent a significant achievement expected for the course and should occupy a significant part of the final portfolio.