National Taiwan University **Advanced Sctructural Theory**
Department of Civil Engineering Instructor: C.-Y. Ke
Fall 2025

Programming Assignment 1
Issued: September 25, 2025 Due: October 9, 2025

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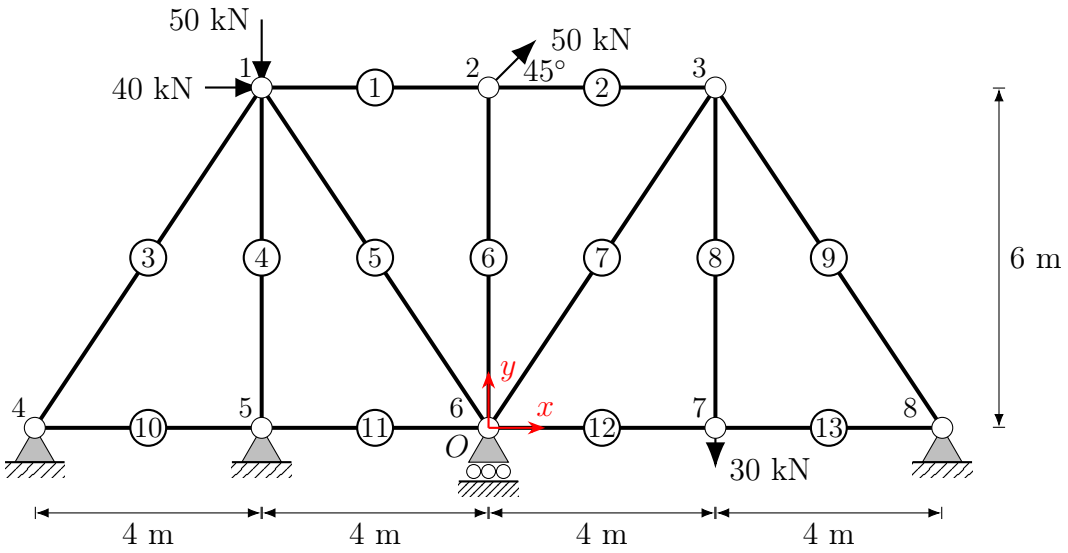
1. Implement `FRAME25` as specified in `FRAME25.m`. Fill in the code only within the sections marked:

```
% --- Starting To Here --- PROG 1
   ...
% --- Up To Here --- PROG 1
```

2. Prepare an input file for the 2D truss structure below using units of kN and m, and save it as `prog-1-2D_Truss.ipt`. Run your program with this input file, print the results in the MATLAB command window, and generate a plot of the truss structure.



- Material properties:
  - Member 1, 2: $E = 250$ GPa, $\nu = 0.23$
  - Member 3 –9: $E = 150$ GPa, $\nu = 0.35$
  - Member 10 –13: $E = 210$ GPa, $\nu = 0.25$
- Sectional properties:
  - Member 1, 2, 10 –13: $A = 8 \times 10^6$ mm^2
  - Member 3 –9: $A = 3 \times 10^6$ mm^2

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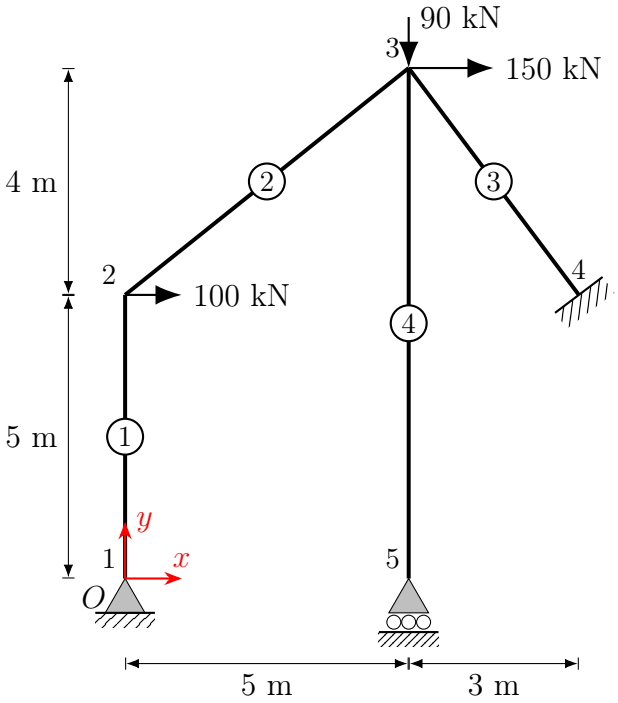
3. Prepare an input file for the 2D truss structure below using units of kN and m, and save it as `prog-1-2D_Frame.ipt`. Run your program with this input file, print the results in the MATLAB command window, and generate a plot of the frame structure.



- Material properties:
  - All Members: $E = 220$ GPa, $\nu = 0.28$
- Sectional properties:
  - All Members: $A = 51 \times 10^4$ mm^2, $I = 9 \times 10^9$ mm^2