Implementation of FEM on HPC (Guided examples)

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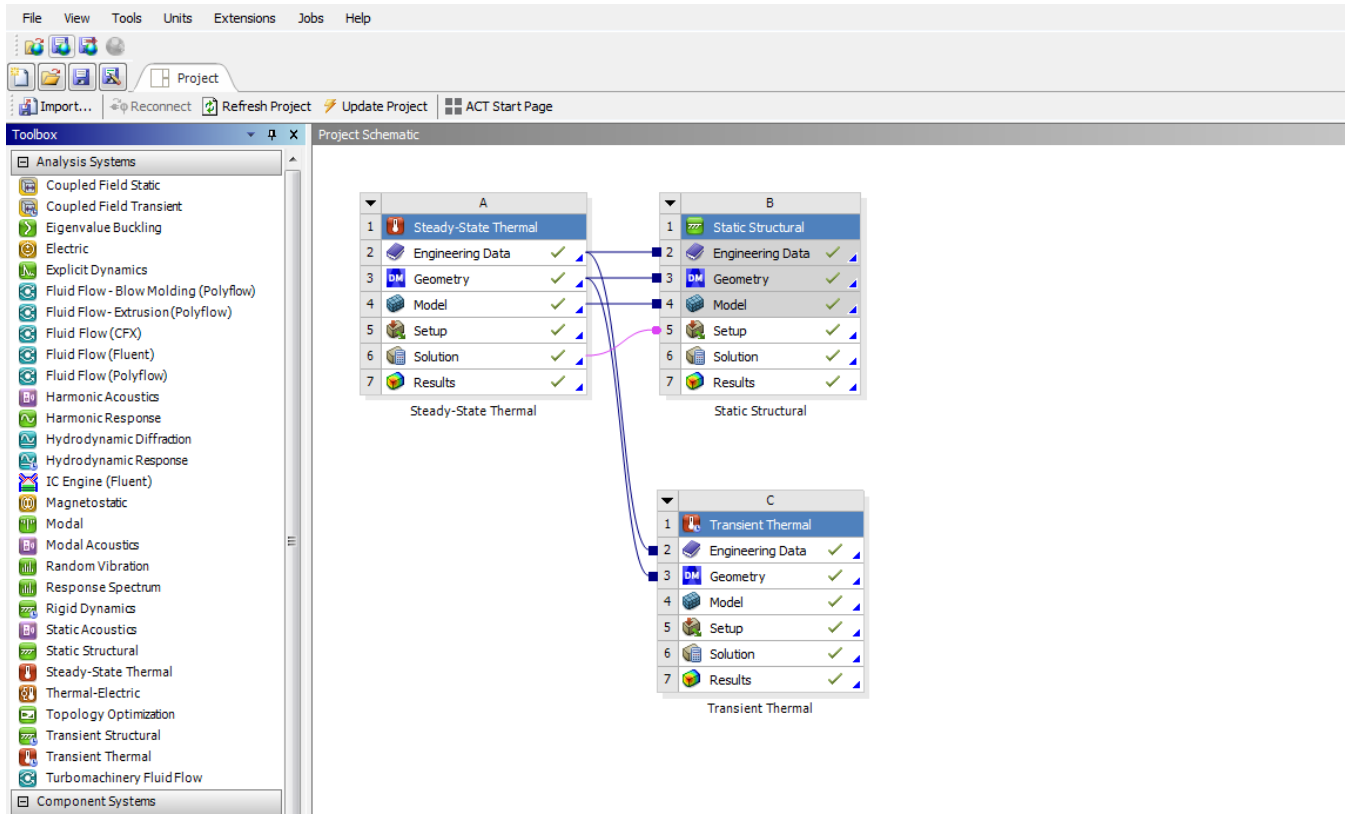
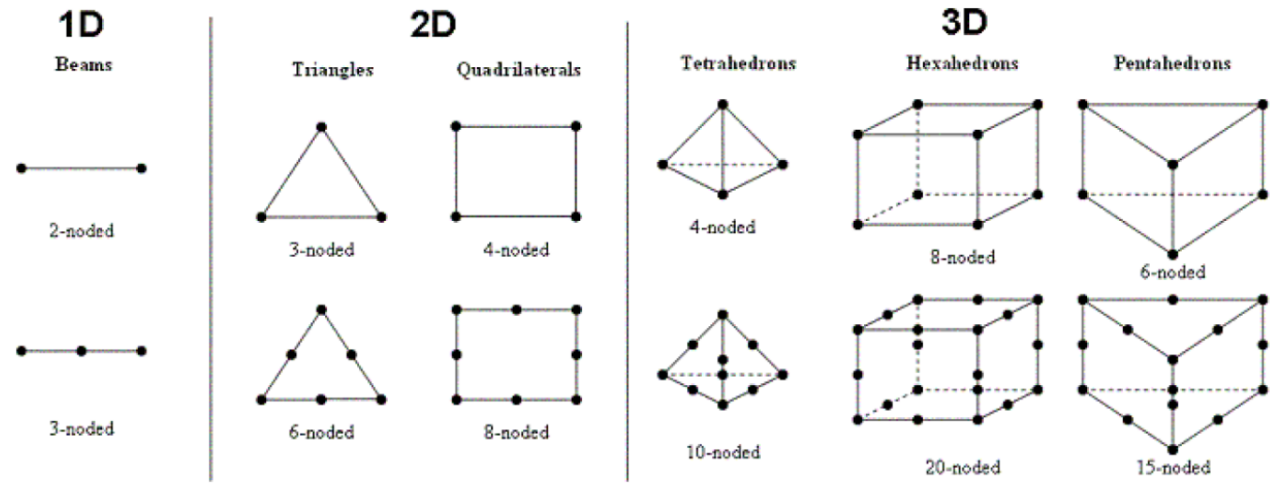
Overview of Ansys Workbench

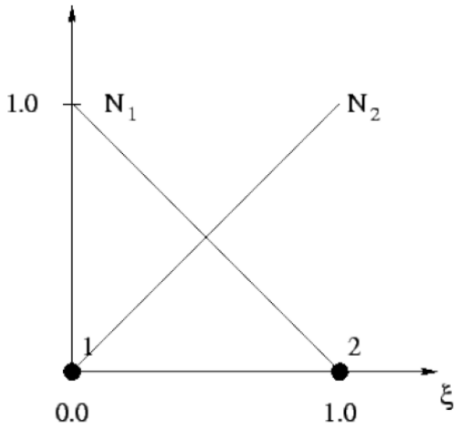
- Analysis types
- Project schematic
- Ansys Mechanical

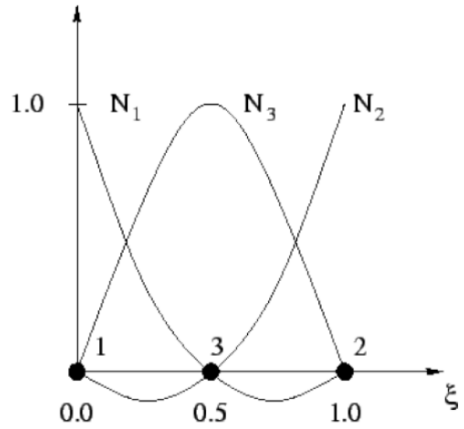


Overview of element types

- Beams
- Shells
- Solids

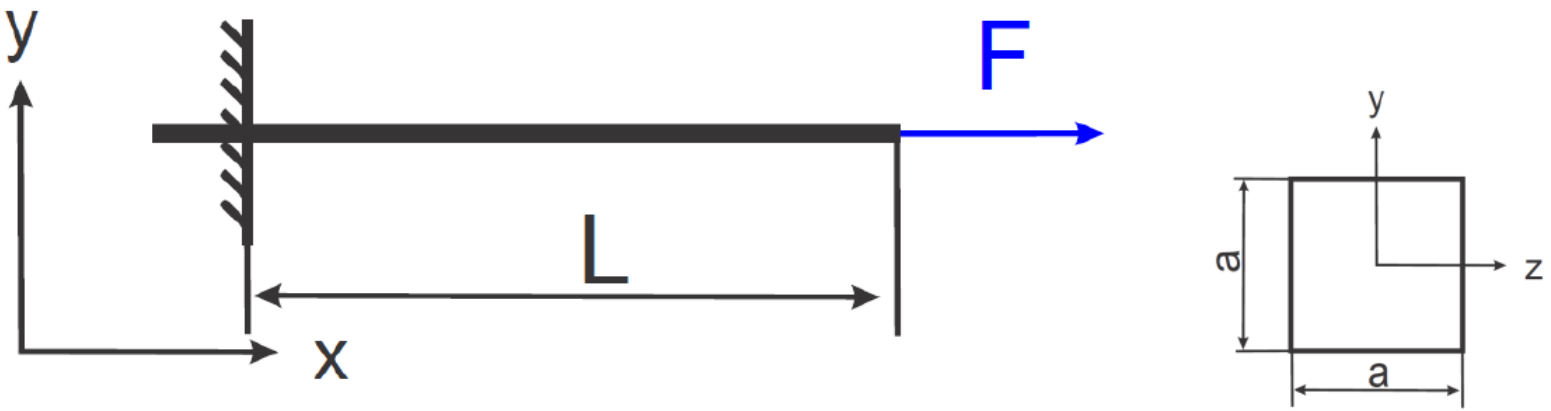






Example I (Cantilever beam)

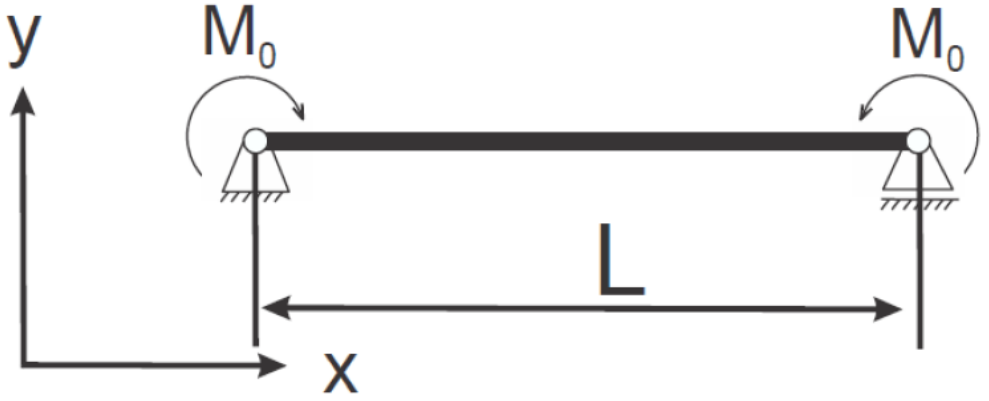
- a = 10 mm
- L = 1000 mm
- F = 20kN
- E = 200 Gpa
- ν = 0.3
- $\sigma = ?, \Delta L = ?$

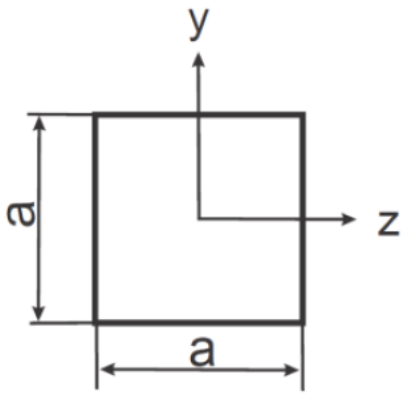


Exact analytical solution: $\sigma = \frac{F}{A} = 200\ \text{MPa}$ $\Delta L = \frac{\sigma \cdot L}{\varepsilon} = 1\ \text{mm}$

Example II (Pure bending)

- a = 100 mm
- L = 1000 mm
- F = 25kNm
- E = 200 Gpa
- ν = 0.3
- σ = ?, y (L/2) = ?





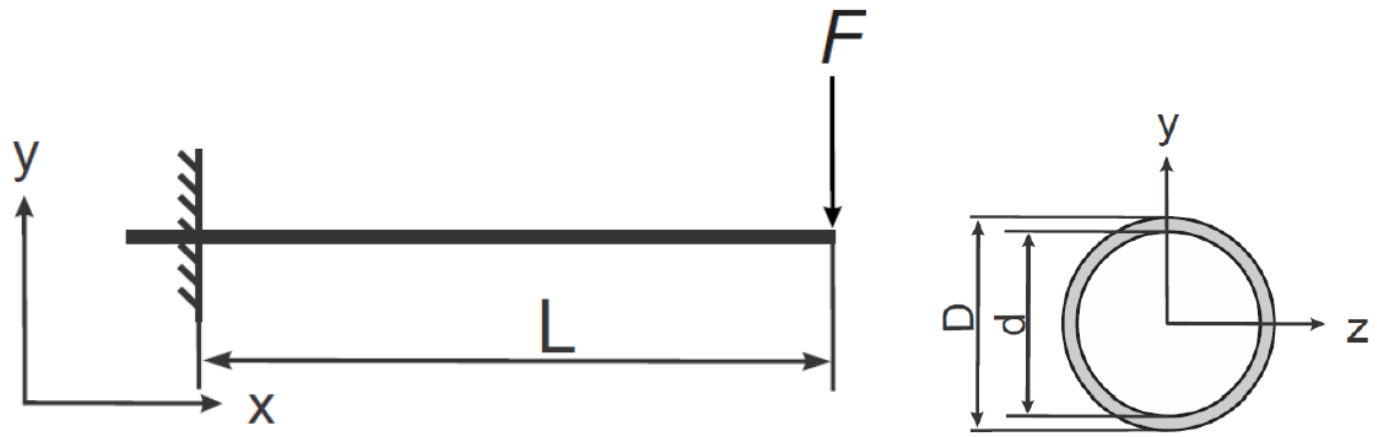
Exact analytical solution:

$$\sigma_X = \frac{M}{W} = 150 \text{ MPa}$$

$$y\left(\frac{L}{2}\right) = \frac{1}{8}\frac{M_0 \cdot L^2}{EI} = 1{,}875 \text{ mm}$$

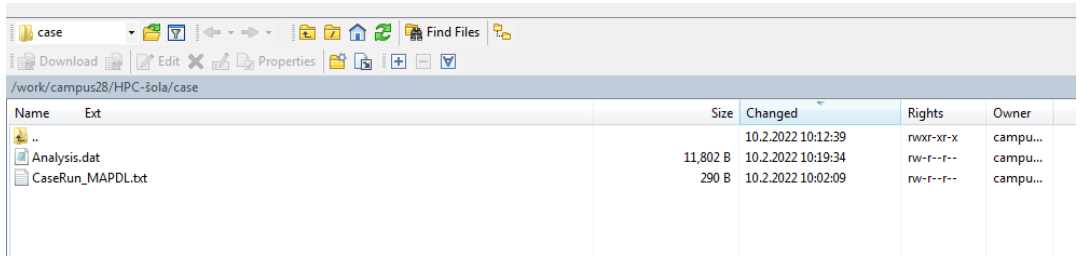
Example III (Individual exercise)

- D = 50 mm
- d = 46 mm
- L = 2000 mm
- F = 250 N
- E = 200 Gpa
- ν = 0.3
- $\sigma = ?, y\,(L) = ?$

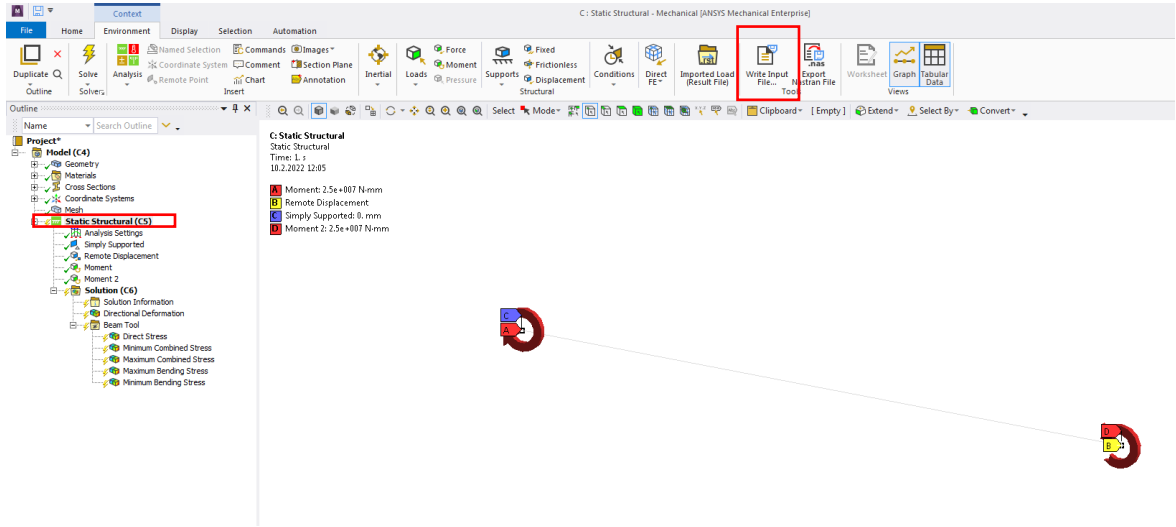


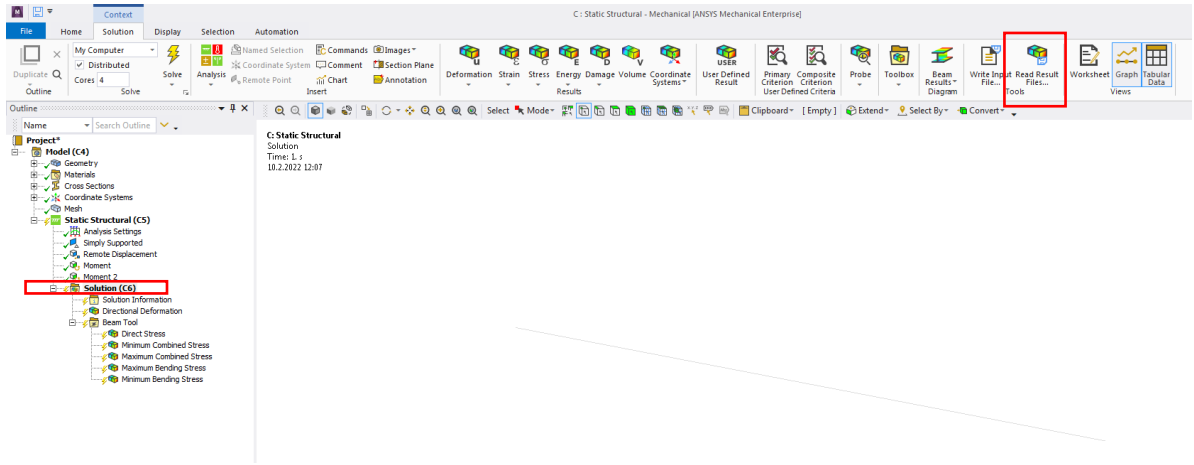
Zagon v batch mode

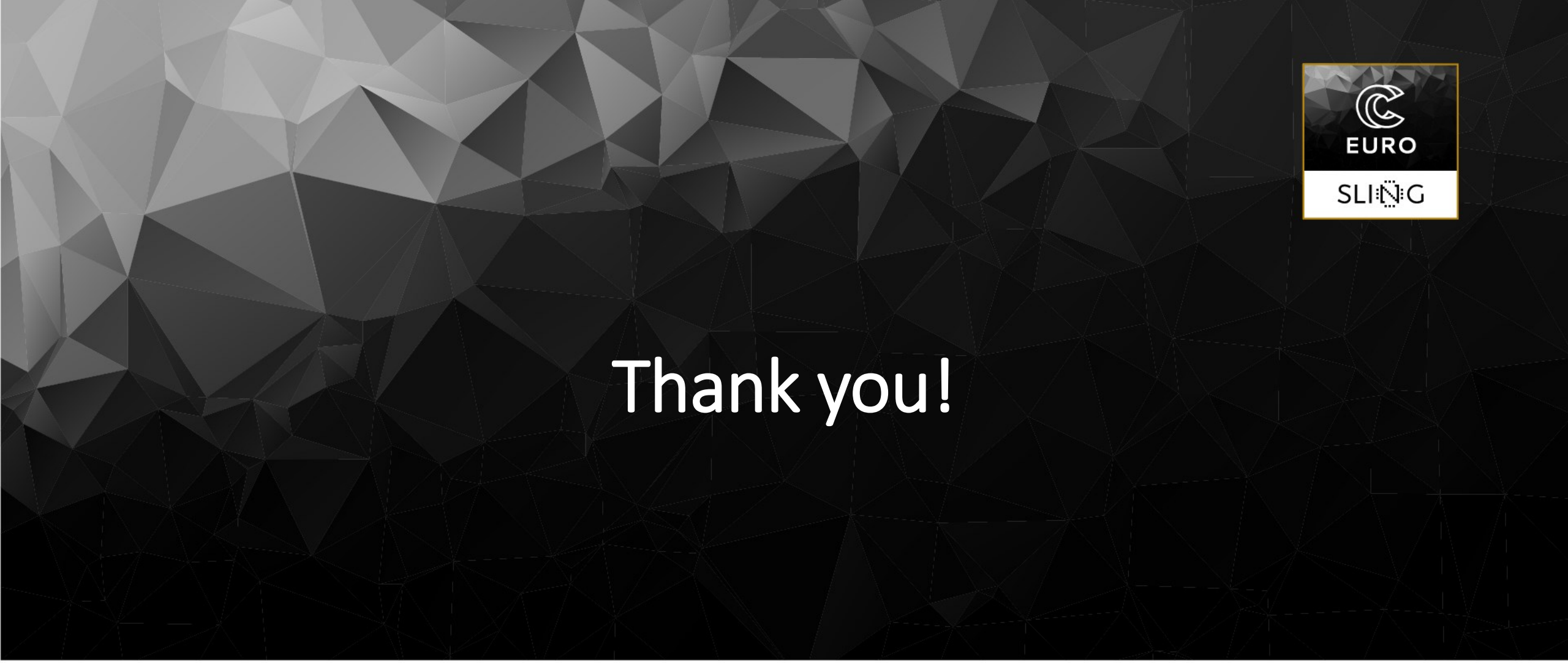
- Izvoz vhodne datoteke
- „srun CaseRun_MAPDL.txt“



- Uvoz datoteke z rezultati







Thank you!

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