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Final Assignment: thermoelastic problem

Shape & Mesh:

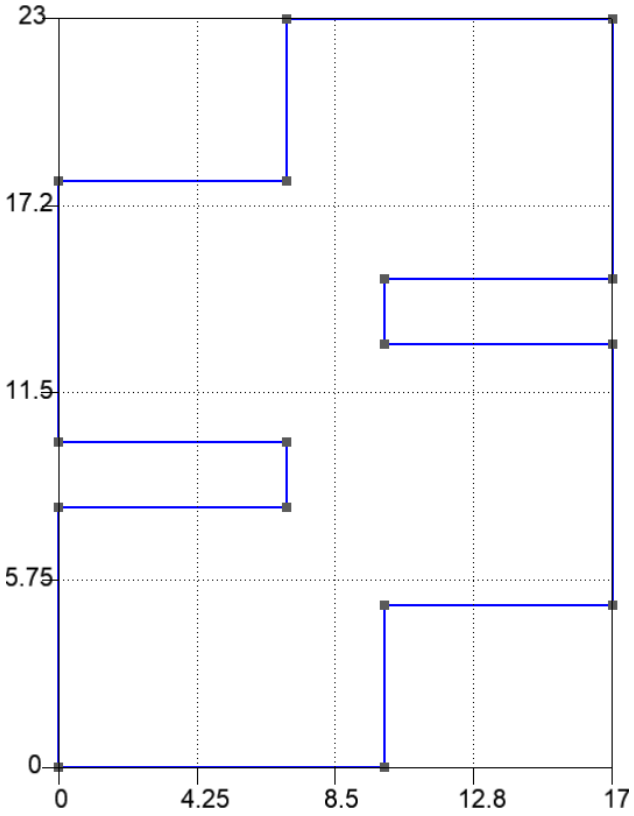

Fig 1. Shape

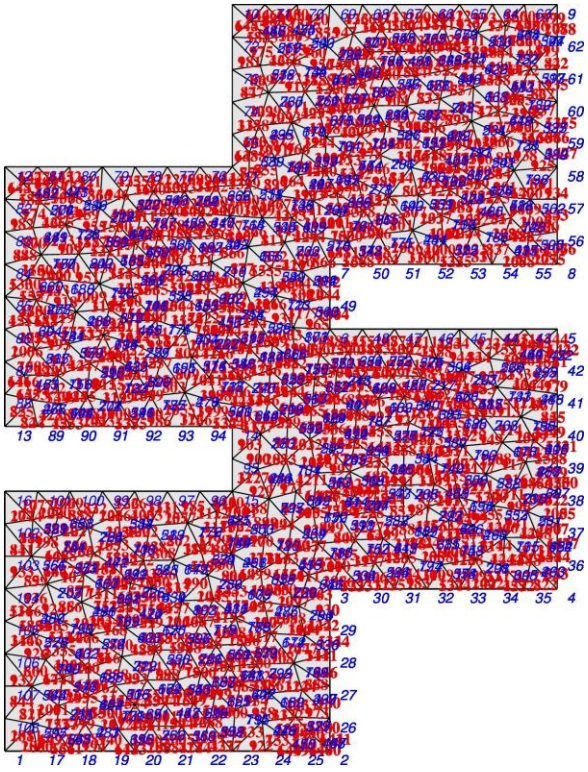

Fig 2. Generated mesh

Equation of temperature:

$$T = \frac{x^2 + y^2}{x + y + 1}$$

Boundary conditions: All the boundaries of the object are fixed and cannot be moved

Solutions:

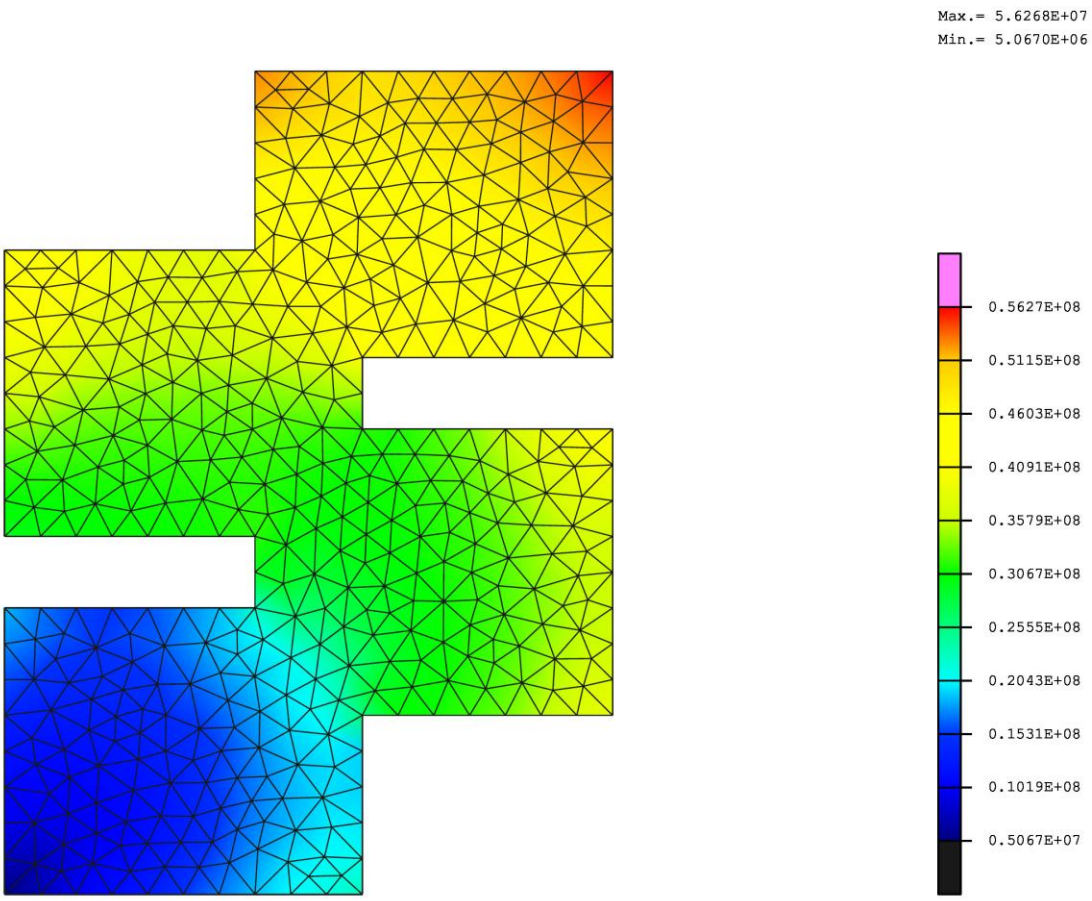

Fig 3. Temperature distribution

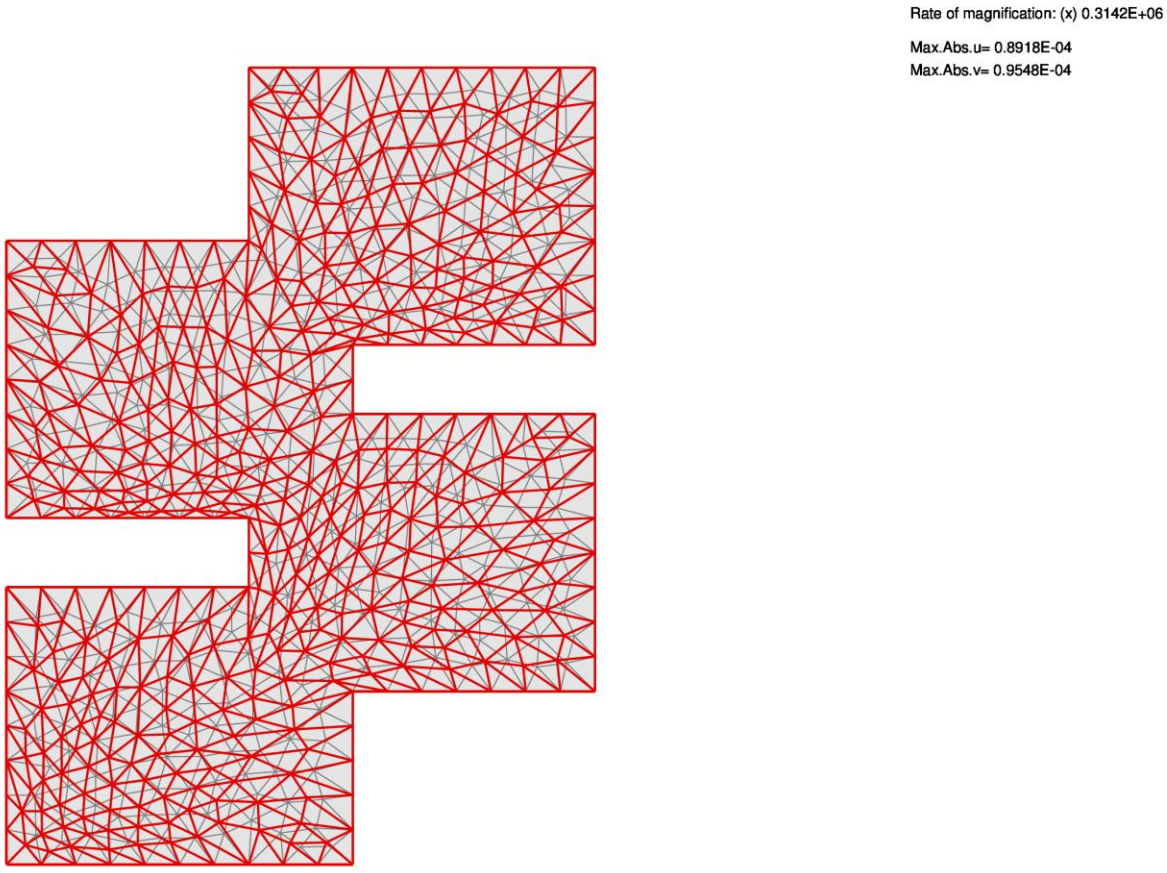

Fig 4. Displacement of the elements

Discussions:

- From the equation of temperature, it can be estimated that the positions with higher values of x and y would have higher temperature. Generally the result of the temperature distribution follows this trend.
- As all the boundaries of the object are fixed, displacement only occurs inside the object.
- The displacement also follows the common knowledge regarding changing temperature: relatively where temperature is high the elements expand and where temperature is low the elements shrink.