# Development of Fem Code for 2-D Elasticity Problems Using Quadrilateral and Triangular Elements

**Authors :** Muhammad Umar Kiani, Waseem Sakawat

**Abstract :** This study presents the development of FEM code using Quadrilateral 4-Node (Q4) and Triangular 3-Node (T3) elements. Code is formulated using MATLAB language. Instead of using both elements in the same code, two separate codes are written. Quadrilateral element is difficult to handle directly, that is why natural coordinates (eta, ksi) are used. Due to this, Q4 code includes numerical integration (Gauss quadrature). In this case, complete numerical integration is performed using 2 points. On the other hand, T3 element can be modeled directly, by using direct stiffness approach. Axially loaded element, cantilever (special constraints) and Patch test cases were analyzed using both codes and the results were verified by using Ansys.