

## Notes For Finite Element Code

This table contains a listing of most of the variables and what they represent. Note, I couldn't use the underscore, so hyphens in the variable names here correspond to underscores in the code. For certain pieces of the code, it is not essential for you to understand explicitly, and I have tried to make comments to that effect.

Variable	Comments
variable	<p>a structure array—this is a fancy data structure that can store lots of information about the unknown variable, e.g. one of the components of variable is a string component stored in the “slot” labelled <i>element</i>, and variable.element is set according to the type of basis elements that the user prefers— e.g. 'continuous-linear', 'continuous-quadratic', etc.</p> <p>variable.dirichlet-node contains a vector with all of the global node numbers of the nodes where a Dirichlet boundary condition is prescribed.</p> <p>variable.dirichlet-value contains a corresponding vector with the actual boundary values associated with all those nodes listed in variable.dirichlet-node.</p> <p>similar comments can be made for the Neumann boundary condition info.</p>
x	<p>cartesian coordinates of the nodes</p> <p>values in row i are the coordinates of global node i</p>
e-conn	row i contains the global node numbers of the nodes that create element number i of the mesh
index-u	component i of the vector contains the global node number of the i-th unknown
index-c	component i of the vector contains the global node number of the i-th known (corresponds to nodes where we have a Dirichlet boundary conditions)
n-nodes	number of nodes in the mesh.
n-dimensions	number of space dimensions of the mesh (1 for us)
n-elements	number of elements in the mesh
nel-dof	number of degrees of freedom in each element
A	system matrix
b	right-hand side vector
r	vector containing coordinates of gauss points in the reference element
w	vector containing the corresponding weights for each of the gauss points
du	solution of the linear system
u	vector containing the approximation at all the nodes along with the Dirichlet boundary conditions (ordered according to the order of the global nodes).