(yet another) FE Code

in MATLAB

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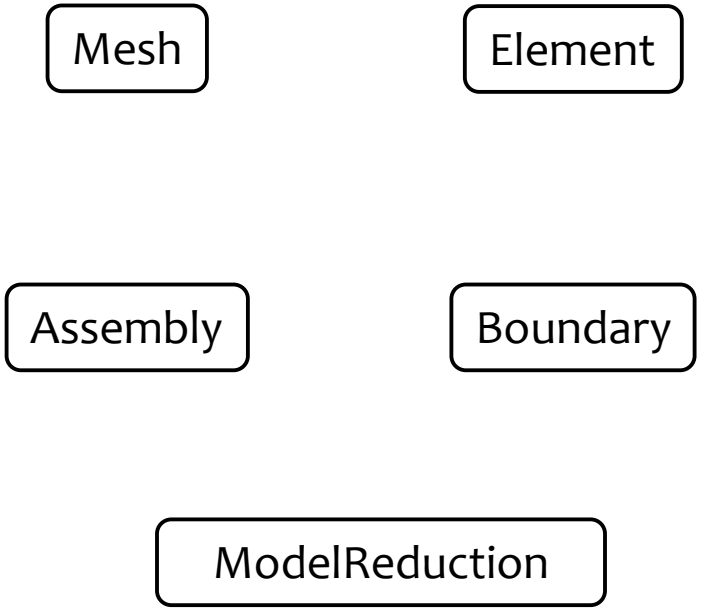
Why?

- Education
- Avoiding rework, mistakes
- Development, collaboration
- Reproducible research

Influences

- Courses
- Paolo's Shell code
- AMFE in Munich
- C++ FE library of Pras Pramnathan

Overview



Mesh

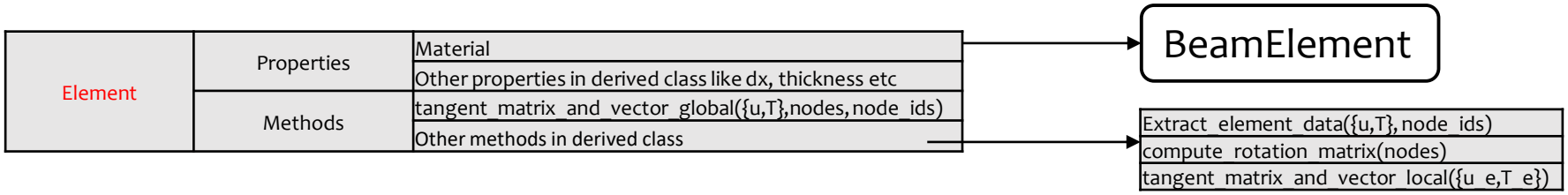
Mesh	Properties	Nodes
		Elements/elements_table
		BoundaryElements
		nDOFPerNode
		nDim
	Methods	get_index(e)
		compute_detJ(e)

Assembly

Assembly	Properties	sparse_storage_indices
		Mesh
	Methods	compute_sparse_storage_indices (Mesh)
		assemble_tangent_matrix({u,T})
		assemble_vector({u,T})

```
assemble_tangent_matrix(x)
For j = 1:n_e
        index = Mesh.get_index(j)
        E = Mesh.ElementsTable(j,:) % element object for element j
        nodes = E.nodes % nodal coordinates
        K = E.tangent_stiffness_global(xe, nodes, node_ids)
        K_global = Assemble(K,index)
end
```

Element



Abstract Class

Boundary

Boundary	Properties	DirichletNodes
		DirichletValues
		NeumannElements
		NeumannValues
	Methods	apply_Dirichlet_BC(node,value)
		apply_Neumann_BC(element, value)