In the present work we study ab-initio electronic structure calculations in real space using density functional theory (DFT), finite elements and pseudopotentials. We summarize the theory and full ab-initio derivation of all equations in finite elements, density functional theory and pseudopotentials, then we explain how our program works and we show results for spherically symmetric potentials in relativistic and nonrelativistic DFT and for 2D and 3D Schrödinger equation for symmetric and non-symmetric potentials.