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function D_sub = Diffusion_Integrator(diff_coeff,order,fespace)
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% $Code Version: 1.0$
% This function performs Diffusion integration over the element and
% generates the element stiffness matrix for this Bilinear operation.
% Inputs : diff_coeff : The co-efficient of diffusion in governing equation
%          order      : Order of polynomial degree used for interpolation
%          fespace     : Elements finite element space structure that
%                      contains its DOF array and grid function of its nodes
% Output : D_sub      : Element Stiffness matrix for the diffusion bilinear
%                      operation

LocalGrid = fespace.LocDOF;
len = length(LocalGrid);
D_sub = zeros(len);
choice = 3; % diffusion

for i=1:len
    for j=1:len
        fIdx = [i j];
        f = Eval_ShapeFn(fIdx,order,choice);
        val = NumInt(f,order,LocalGrid,choice);
        D_sub(i,j) = diff_coeff*val;
    end
end

end

```

