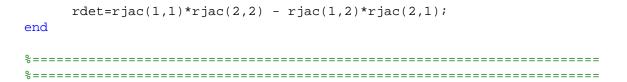
```
% Function [Tint] = Tint(u,v)
 integrand for S element matrix integral: grad dot grad
function [Tint] = Tint(u,v)
    global itest ibasis
    [tu, tv, t] = basis(itest,u,v);
     [bu, bv, b] = basis(ibasis,u,v);
     [rdet, rjac] = rjacob(u,v);
  Tint = t*b*rdet;
end
% Function [b, bu, bv] = basis(ibas,u,v)
% Basis function & first derivatives at (u,v) in standard triangle
function [bu, bv, b] = basis(ibas,u,v)
응
    quadratic Lagrangian bases on a standard triangle
응
ુ
    (u,v,w) are the simplex variables
    w=1-u-v;
    if(ibas == 1)
       b=(2*u-1)*u;
       bu=4*u-1;
       bv=0;
    elseif(ibas == 2)
       b=(2*v-1)*v;
       bu=0;
       bv=4*v-1;
    elseif(ibas == 3)
       b=(2*w-1)*w;
       bu=-3+4*u+4*v;
       bv = -3 + 4 * u + 4 * v;
    elseif(ibas == 4)
       b=4*v*w;
       bu=-4*v;
       bv=4-4*u-8*v;
    elseif(ibas == 5)
       b=4*u*w;
       bu=4-8*u-4*v;
       bv=-4*u;
    elseif(ibas == 6)
```

```
b=4*u*v;
        bu=4*v;
        bv=4*u;
     else
        disp('ibas out of range in BASIS: '); disp(ibas)
end
rjacob: jacobian matrix for curved triangle patch transformation
function [rdet,rjac] = rjacob(u,v)
     Jacobian matrix associated with the mapping from a curved
ુ
     patch in 2D space to a reference cell of triangular shape.
응
9
  variables defined on input:
응
     Local coordinates are (u,v)
     Cell index is 'ncell'
ુ
응
응
  variables produced as output:
응
     determinant is 'rdet'
     Jacobian matrix is 'rjac'
     global pcetond xy;
     global icell;
     x(6)=0; y(6)=0;
    for i=1:6
    j=pcetond(icell,i);
    x(i)=xy(j,1);
    y(i)=xy(j,2);
     end
     r_{jac}(1,1) = 4.*x(5)-3.*x(3)-x(1) + 4.*u*(x(1)+x(3)-2.*x(5)) +
                4.*v*(x(3)+x(6)-x(5)-x(4));
     rjac(1,2) = 4.*y(5)-3.*y(3)-y(1) + 4.*u*(y(1)+y(3)-2.*y(5)) +
                4.*v*(y(3)+y(6)-y(5)-y(4));
     rjac(2,1) = 4.*x(4)-3.*x(3)-x(2) + 4.*u*(x(3)+x(6)-x(5)-x(4)) +
                4.*v*(x(2)+x(3)-2.*x(4));
     rjac(2,2) = 4.*y(4)-3.*y(3)-y(2) + 4.*u*(y(3)+y(6)-y(5)-y(4)) +
                4.*v*(y(2)+y(3)-2.*y(4));
     calculate determinant
```

2



Published with MATLAB® R2018a