Radius & velocity to Orbital elements

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```
function [a,e,i,RAAN,omega,nu] = rv2oe(r_vec,v_vec,mu)
% This function computes the orbital elements for a given set radius and
% velocity vectors in the ECI france
% - r_vec = radius vector [km]
% - v_vec = velocity vector [km/s]
%
% The function output 6 orbital elements
%

r = norm(r_vec);
v = norm(v_vec);

h_vec = cross(r_vec,v_vec);
h = norm(h_vec);
n_vec = cross([0;0;1],h_vec);
n = norm (n_vec);
% e_vec = (1/mu)*(((v^2-(mu/r))*r_vec)-(dot(r_vec,v_vec)*v_vec));
e_vec = (1/mu)*((cross(v_vec,h_vec))-((mu/r)*r_vec));
e_norm = norm(e_vec);
e = [e_vec;e_norm];

a = h^2/(mu*(1-e_norm^2));

i = rad2deg(acos(h_vec(3)/h));

RAAN = rad2deg(acos(n_vec(2)/n));
if n_vec(2) > 0 && RAAN > 180
    RAAN = RAAN-180;
elseif n_vec(2) < 0 && RAAN < 180
    RAAN = RAAN+180;
end

omega = rad2deg(acos((dot(n_vec,e_vec)/(n*e_norm))));
if e_vec(3) > 0 && omega > 180
    omega = omega - 180;
elseif e_vec(3) < 0 && omega < 180
    omega = omega + 180;
end

nu = rad2deg(acos((dot(e_vec,r_vec))/(e_norm*r)));
if dot(r_vec,v_vec)>0 && nu>180
    nu = nu-180;
elseif dot(r_vec,v_vec)<0 && nu<180
    nu = nu+180;
end

end
```

```
Not enough input arguments.
```

```
Error in rv2oe (line 14)
r = norm(r_vec);
```

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