```matlab
R_ned2b = eulerToRotationMatrix(phi,theta,psi);

% compute wind vector in body frame (wind_ned is an input)
wind_b = R_ned2b*wind_ned;

% compute airspeed Va, angle-of-attack alpha, side-slip beta
[Va, alpha, beta] = makeVaAlphaBeta(vg_b - wind_b);

% Longitudinal Aero Coefficients
C_L = P.C_L_0 + (P.C_L_alpha * alpha) + (P.C_L_q*P.c/2/Va*q) + (P.C_L_delta_e*delta_e);
C_D = P.C_D_0 + abs(P.C_D_alpha*alpha) + abs(P.C_D_q*P.c/2/Va*q) + abs(P.C_D_delta_e*delta_e);
C_m = P.C_m_0 + (P.C_m_alpha*alpha) + (P.C_m_q*P.c/2/Va*q) + (P.C_m_delta_e*delta_e);

% Lateral Aero Coefficients
C_Y = P.C_Y_0 + (P.C_Y_beta*beta)+(P.C_Y_p*P.b/2/Va*p) + (P.C_Y_r*P.b/2/Va*r) +
(P.C_Y_delta_a*delta_a) + (P.C_Y_delta_r*delta_r);
C_ell = P.C_ell_0 + (P.C_ell_beta*beta) + (P.C_ell_p*P.b/2/Va*p) + (P.C_ell_r*P.b/2/Va*r) +
(P.C_ell_delta_a*delta_a) + (P.C_ell_delta_r*delta_r);
C_n   = P.C_n_0 + (P.C_n_beta*beta) + (P.C_n_p*P.b/2/Va*p) + (P.C_n_r*P.b/2/Va*r) +
(P.C_n_delta_a*delta_a) + (P.C_n_delta_r*delta_r);

% Create and combine Forces
f_grav_ned = P.mass * [0; 0; P.gravity]; % Newtons

f_grav_b = R_ned2b*f_grav_ned;
f_aero_b = 0.5*P.rho*Va*Va*P.S_wing*[-C_D*cos(alpha) + C_L*sin(alpha);C_Y;-C_D*sin(alpha)-
C_L*cos(alpha)];
f_prop_b = zeros(3,1);
f_b = f_grav_b + f_aero_b + f_prop_b;

% Create and combine Moments
m_aero_b = 0.5 * P.rho * Va * Va * P.S_wing * [P.b*C_ell;P.c*C_m; P.b*C_n];
m_prop_b = zeros(3,1);
m_b = m_aero_b + m_prop_b;
```