function [Alon, Blon, Alat, Blat] = AircraftLinearModel(trim\_definition, trim\_variables, aircraft\_parameters)

%

% STUDENT COMPLETE

u0 = trim\_definition(1);

h0 = trim\_definition(2);

alpha0 = trim\_variables(1);

de0 = trim\_variables(2);

dt0 = trim\_variables(3);

theta0 = alpha0;

ap = aircraft\_parameters;

rho = stdatmo(h0);

%%%%%%%%%%%%%%%%%%%%%%

%%% Longitudinal

%%%%%%%%%%%%%%%%%%%%%%

%%%% Trim values

CW0 = ap.W/((1/2)\*rho\*u0^2\*ap.S);

CL0 = CW0\*cos(theta0);

CD0 = ap.CDmin + ap.K\*(CL0-ap.CLmin)^2;

CT0 = CD0 + CW0\*sin(theta0);

%%%% Nondimensional stabiulity derivatives in body coordinates

%%%%% This is provided since we never discussed propulsion - Prof. Frew

dTdu = dt0\*ap.Cprop\*ap.Sprop\*(ap.kmotor-2\*u0+dt0\*(-2\*ap.kmotor+2\*u0));

CXu = dTdu/(.5\*rho\*u0\*ap.S)-2\*CT0;

CDu = 0;%CDM\*Ma; % Compressibility only. Ignore aeroelasticity and other effects (dynamic pressure and thrust).

CLu = 0;%CLM\*Ma;

Cmu = 0;%CmM\*Ma;

CZu = [];

CZalpha =[];

CXalpha = [];

CZalphadot = [];

CZq = [];

% Longitudinal dimensional stability derivatives (from Etkin and Reid)

Xu = [];

Zu = [];

Mu = [];

Xw = [];

Zw = [];

Mw = [];

Xq = 0;

Zq = [];

Mq = [];

Xwdot = 0;

Zwdot = [];

Mwdot = [];

% Matrices

Alon = [];

Blon = zeros(6,2);

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

%%% Lateral

%%%%%%%%%%%%%%%%%%%%%%%%%%

% Lateral-directional dimensional stability derivatives

Yv = [];

Yp = [];

Yr = [];

Lv = [];

Lp = [];

Lr = [];

Nv = [];

Np = [];

Nr = [];

G = ap.Ix\*ap.Iz-ap.Ixz^2;

G3=ap.Iz/G;

G4=ap.Ixz/G;

G8=ap.Ix/G;

Alat = [];

Blat = zeros(6,2);