Assignment-2

Due date 10-03-2023.

Problem Statements: -

1. Plot the variation of longitudinal force and moment coefficients with angle of attack, velocity, and control surface deflections for all cases.
2. Estimate all possible longitudinal stability and control derivative that we have discussed during. **Cla, Cma, Cm0, Cmde, Clde**
3. Find the location of Neutral Point from nose of the projectile.

Consider the following instructions for processing the wind tunnel data of a guided projectile-

1. Speed 1, 2 & 3 corresponds to 40 m/s, 50 m/s & 60 m/s respectively.
2. Nomenclature in the given wind tunnel data:
    a) Body alone is without tail fins.
    b) Body_TF_0 means body with 4 tail fins and 0 elevator deflection only, kindly ignore other elevator deflections.
    c) Similarly, Body_TF_+5 means body with 4 tail fins and +5 elevator deflection only, kindly ignore other elevator deflections.
    d) Body_NF_TF means body with nose fins and tail fins with corresponding deflection.
3. Balance centre is at a distance of -0.465 m (behind) from the nose of the guided projectile.
4. Consider z-axis pointing downward, Reference chord and span are equal to projectie's diameter and area would be cross-section area of projectile.
5. Consider N1, N2, S1, S2, Rm and Ax as voltage signals.
6. Pitch angle is equivalent to angle of attack measured in degrees.
7. Photographs/figures are attached for your reference.

Consider SM = +15%