Announcements:
Fluids Lab 1 (SPL8) – Assignment
Wind Tunnel Pitot Measurements

Learning Objectives
– Practice acquiring and reducing wind tunnel data
– Practice using pitot probe relations (Bernoulli, etc)
– Familiarization with tunnel test procedures

Experimental Rig
Test Article: F-16 model in Wright Brothers Wind Tunnel
Instrumentation:
– Tunnel’s pitot-static probe
– Hand-held pitot-static probe
– Tunnel’s force balance

Test Conditions
Nominal tunnel speed: 50 mph
Angles of attack: \( \alpha = 0^\circ, 5^\circ, 10^\circ, 15^\circ \)

Raw Data Acquired
\( p_\infty, p_{o\infty} \) (from tunnel’s pitot-static probe)
\( p(x), p_o(x) \) (along nose centerline, using hand-held pitot probe)
Lift, Drag (from tunnel balance)

Normalized Data Presented
Top and bottom centerline \( C_p(x) \) for each \( \alpha \). (All 8 curves on one plot)
\( C_L(\alpha), C_D(\alpha) \)

Analysis
Propose locations of static ports on centerline, and how their measured \( p \)'s could be used to best estimate \( p_\infty \) and hence \( V_\infty \) for any \( \alpha \). You may assume that \( p_{o\infty} \) is known accurately on the aircraft (since this is easy to measure).