Unsteady BEM for VAWT

This Assignment deals with a Vertical Axis Wind Turbine, VAWT and how to estimate the time dependent loads using an unsteady BEM approach, **as described in the lecture notes.**

R=3m, V_o=8m/s, ω=14 rad/s, S=Bc/R=0.2, ρ=1.225 kg/m^3. The airfoil data are given in the file airfoil.txt.

Q#1: Compare the time history of the total loads $p_{x,tot}(t)$ and $p_{y,tot}(t)$ for B=1, 2 and 3. The total load is the sum of the loads for all blades and is the force experienced by the tower. Also, state the power coefficient, C_p, and thrust coefficient, C_T.

Q#2: Plot for both B=1 and B=3 the axial loads $p_x(t)$ for the individual blades in the time interval between t=6s and 7s to explain the differences seen in Q#1. Do the same for the lateral loads $p_y(t)$