```
clear
clc
close all

U= [.12 .2 100 200];
L= 5;
W= 8;
x=[0:.01:L];
n= 8;
m= (n+1)/2;
C1= 8.74;
C2= 2*C1^(-2*n/(n+1));
rho= 1000;
nu= 1e-6;

for i=1:length(U)
    delta= (x*(n+1)*(n+2)*C2/(2*n*(rho*U(i)/nu)^(1/m))*(1/m+1)).^(m/(m+1));
    deltam= delta/9;
    Rex= rho*U(i)*x/nu;
    Cf= .0375./Rex.^(2/11);
    Re(i)= rho*U(i)*L/nu;
    Cd(i)= .0458/Re(i)^(2/11);
    D(i)= Cd(i)*5*rho*U(i)^2*L*W;
    P(i)= D(i)*U(i);
    figure (i)
    plot(x,delta,'--')
    hold on
    plot(x,deltam)
    hold on
    xlabel('x')
    ylabel('delta')
    title('Momentum Thickness/Boundary Layer Thickness vs Length of the Plate')
    figure (5)
    plot(x,Cf)
    xlabel('x')
    ylabel('Cf')
    title('Local Skin Friction vs Length of the Plate')
    hold on
end
figure(1)
legend('BL: .12 m/s','Mom.: .12 m/s')
figure(2)
legend('BL: .2 m/s','Mom.: .2 m/s')
figure(3)
legend('BL: 100 m/s','Mom.: 100 m/s')
figure(4)
legend('BL: 200 m/s','Mom.: 200 m/s')
figure(5)
legend('Cf: .12 m/s','Cf: .2 m/s','Cf: 100 m/s','Cf: 200 m/s')
figure(6)
plot(U,P)
xlabel('Fluid Velocity (m/s)')
ylabel('Power (N*m/s)')
title('Fluid Velocity vs Power Required')
```