```
clc;
clear;
close all;

N = 51;
airfoil_num = [2 4 1 2];
TT = airfoil_num(3)*10 + airfoil_num(4);
M = airfoil_num(1);
P = airfoil_num(2);
p = 4/10;
t_max = TT/100;
m = M/100;
x = [];
for i = 1:N
    x(i) = 1/2*(1-cos((i-1)*2*pi/(N-1)));
end
yt = 5*t_max*(0.2969*sqrt(x) - 0.1260*x - 0.3516*x.^2 + 0.2843*x.^3 - 0.1036*x.^4);
y_bar = [];
for i = 1:N
    if x(i) >= 0 && x(i) <= p
        y_bar(i) = m/(p^2)*x(i)*(2*p-x(i));
    end
    if x(i) > p && x(i) <= 1
        y_bar(i) = m/(1-p)^2*(1-2*p+2*p*x(i)-x(i)^2);
    end
end

theta = [];
for i = 1:N
    if i ~= N
        theta(i) = atan((y_bar(i+1) - y_bar(i))/(x(i+1) - x(i)));
    end
    if i == N
        theta(i) = atan((y_bar(i) - y_bar(i-1))/(x(i) - x(i-1)));
    end
end

x_u = x - yt.*sin(theta);
x_l = x + yt.*sin(theta);
y_u = y_bar + yt.*cos(theta);
y_l = y_bar - yt.*cos(theta);

figure(1)
hold all
axis equal
plot(x_u, y_u, '-o')
plot(x_l, y_l, '-o')
plot(x, y_bar, '-x')
```

```
for i = 1:ceil(N/2)
    x_points(i) = x_u(i);
    x_points(N-i+1) = x_l(i);
    y_points(i) = y_u(i);
    y_points(N-i+1) = y_l(i);
end

for i = 1:N-1
    x_center_panel(i) = (x_points(i) + x_points(i+1))/2;
    y_center_panel(i) = (y_points(i) + y_points(i+1))/2;
end

plot(x_center_panel, y_center_panel,'*')
```