```matlab
1 % Kavya Manchanda
2 % 11/1/2022
3 % ECE 202: Project 1 - Power Expansion Series of function of the form
4 % Acos(wt)
5 % Phase 2 : Adding features to improve the output
6
7 clear; clf;
8 format shortG;
9
10 tmin = 0;        % in ms
11 tmax = 200;      % in ms
12 N = 400;         % intervals
13
14 tms = linspace(tmin, tmax, N+1);  % time array in ms
15 t = tms/1000;                     % time array in s
16 n = 0:2:10;                       % array of nth term
17
18 % The angular frequency in rad/s
19 an = (12.*(-1).^(n./2).*40.^n)./factorial(n);
20
21 coefTable = table(n.',an.','VariableNames',{'n', 'a_n'})
22
23 f1 = an(1)*t.^n(1);       % first sum (ie. first term) in the power series
24 f2 = f1 + an(2)*t.^n(2); % sum of first two terms
25 f3 = f2 + an(3)*t.^n(3); % sum of first three terms
26 f4 = f3 + an(4)*t.^n(4); % sum of first four terms
27 f5 = f4 + an(5)*t.^n(5); % sum of first five terms
28 f6 = f5 + an(6)*t.^n(6); % sum of first six terms
29
30 %----- plotting the graph and its attributes -----
31 hold on
32
33 plot([0,200],[0,0], 'k', 'LineWidth', 1);
34 p1 = plot(tms,f1,tms,f2,tms,f3,tms,f4,tms,f5,'LineWidth',2.5);
35 p2 = plot(tms,f6,'LineWidth',5);
36 legend([p1;p2],"Up to n = " + n,"FontSize",18,"Location","bestoutside")
37
38 ax = gca;
39 ax.GridAlpha = 0.4;
40 ax.FontSize = 16;
41 xlabel('time t (ms)','FontSize',18);
42 ylabel('f(t)','FontSize',18)
43 ylim([-15,15])
44 title(["ECE 202 Project 1 Phase 2:", ...
45     "Power series expansion of f(t)=12cos(40t) using truncated " + ...
46     "sums with up to 6 non-zero terms."],"FontSize",20)
47
48 grid on
49 hold off
```