```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 s
11 tmax = 0.2;    % in s
12 N = 400;       % intervals
13
14 t = linspace(tmin, tmax, N+1);  % time array in s
15 tms = t.*1000;                  % time array in ms
16 n = 0:2:10;                     % number of terms
17
18 % The angular frequency in rad/s
19 an = (12.*(-1).^(n./2).*40.^n)./factorial(n);
20
21 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',1.6);
35 p2 = plot(tms,f6,'LineWidth',3);
36 legend([p1;p2],"n = " + n,"FontSize",18,"Location","best")
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","FontSize",20)
45 subtitle("Adding features to improve the output")
46
47 grid on
48 hold off
```

```
>> project1phase2

ans =

  6×2 table

    n          a_n
    __      _____

     0              12
     2           -9600
     4        1.28e+06
     6     -6.8267e+07
     8      1.9505e+09
    10     -3.4675e+10

>>
```

ECE 202 Project 1 Phase 2

Adding features to improve the output

	n = 0
	n = 2
	n = 4
	n = 6
	n = 8
	n = 10