

Jonathan Sumner

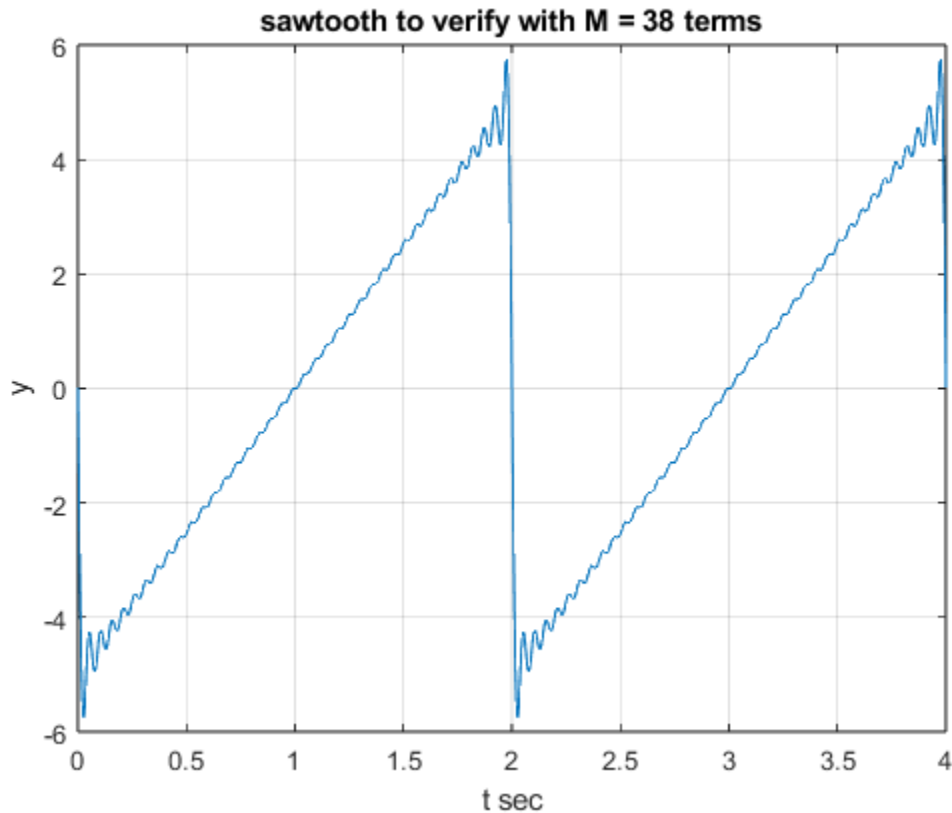
Lab 7 – Harmonic and Spectrum

EEET-332.01 – Signals, Systems, and
Transformers Lab

Due Date: 11/03/2024

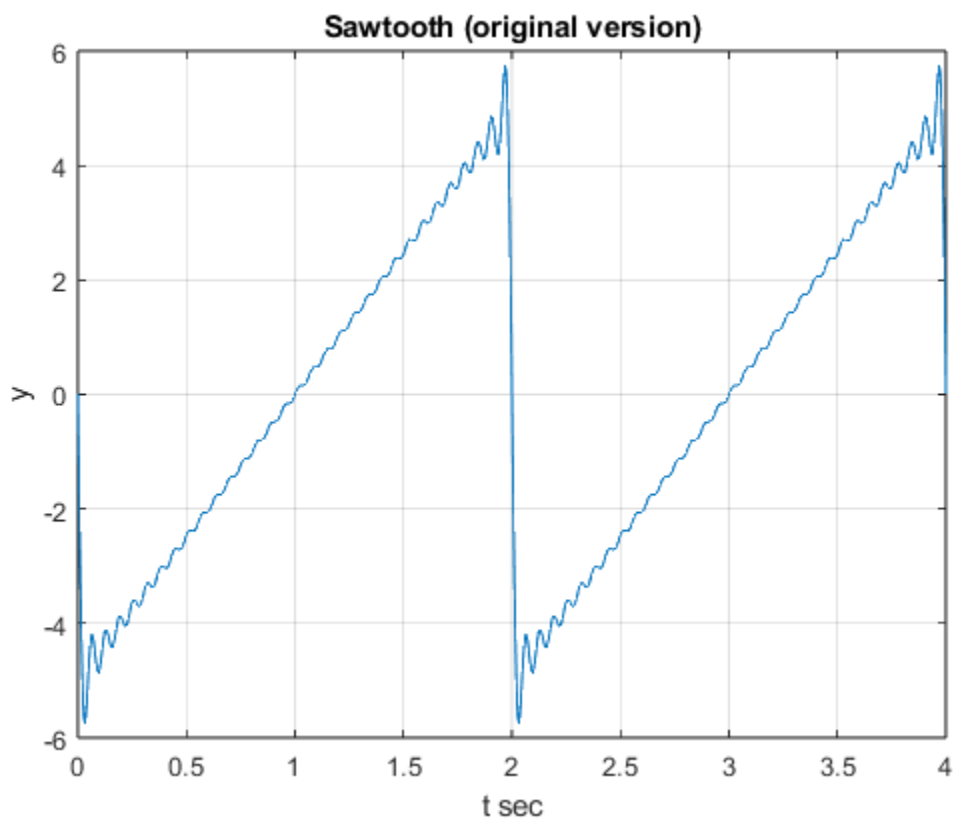
Section 3

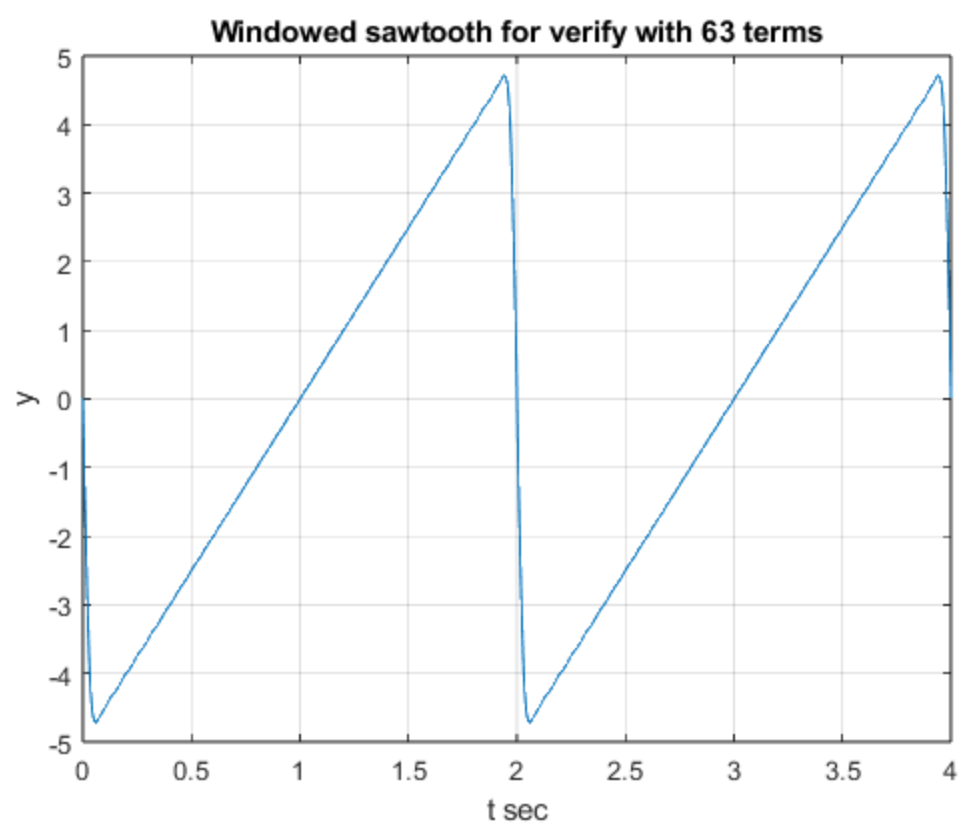
```
15 make_stem(m,cm,'Spectrum','harmonic','Fourier coefficient');
16 % Find power
17 Pcm = (abs(cm).*abs(cm));
18 make_stem(m,Pcm,'Power Spectrum','harmonic','power');
19 %Find cumulative power in spectrum lines
20 % Find zero element in m
21 zero_ind=find(m == 0);
22 % Find all positive values in m (1 through M)
23 pos_ind = find(m > 0 & m <= M);
24 Pcm_harmonic = [Pcm(zero_ind) 2*Pcm(pos_ind)];
25 make_stem([0:M],cumsum(Pcm_harmonic),'Cumulative Power Spectrum','harmonic','cumulative power');
26
27 M = 38; % number of harmonics
28 T = 2; % waveform period 2s
29 [m,cm] = create_cm_series(M,T); % create fourier coefficients
30 t = 0:4/1000:4; % 1001 points from 0 sec to 4 sec
31 [y] = cm2yt(t,T,m,cm,M);
32 make_plot(t,y,'sawtooth to verify with M = 38 terms','t sec','y');
```



Section 4

```
33 init();
34 M = 31;
35 T = 2; % waveform period 2s
36 [m,cm] = create_cm_series(M,T); % create Fourier coefficients
37
38 t = 0:4/1000:4; % 1001 points from 0 sec to 4 sec
39
40 % original sawtooth
41 [y] = cm2yt(t,T,m,cm,M);
42 make_plot(t,y,'Sawtooth (original version)','t sec','y');
43
44 % windowed sawtooth
45 win = hamming(2*M+1)'; %Hamming window
46 cwin = cm.*win; %windowed Fourier coefficients
47 [ywin] = cm2yt(t,T,m,cwin,M); % <---- Complete this line
48 make_plot(t,ywin,'Windowed sawtooth for verify with 63 terms','t sec','y');
```





Signals Systems and Transforms
EEET-332
Lab 7

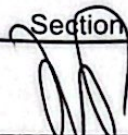
Report:

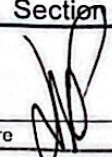
Create your own cover page.

Submit your cover page, the requested screenshots (sections 3 and 4), and this sign-off sheet.

Sign-offs

Name Jonathan Sumner

Section 1: Table 1 and plot of the sawtooth using 9 terms	
	10 28 24
Signature	Date

Section 2: Sawtooth wave using 127 terms	
	10 28 24
Signature	Date