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Assignment 4
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Assignment 4

- Problem 1:
  For this problem we simply received a matlab file called fourier_series_exp.m which consisted of a function which will take in four arguments (x,t,nK,p) and solves for Ck as well as plotting the absolute value of ck vs k as well as the angle values of Ck vs k as well as a reconstructed signal which is created via plotting 3 cycles of x.(see actual code for results)
- Problem 2:
  For this problem we simply received a function and were required to simply plot abs(ck) vs k as well as the angle(ck) vs k as well as the reconstructed signal meaning that we are essentially calling the fourier series exp function called previously. This is pretty much testing the previous part of the lab. Below is the result from running the function(figure 1-3) as well as the reconstructed signal and finally the original signal to show that the reconstructed version(which has 3 phases) has the function as in the original:

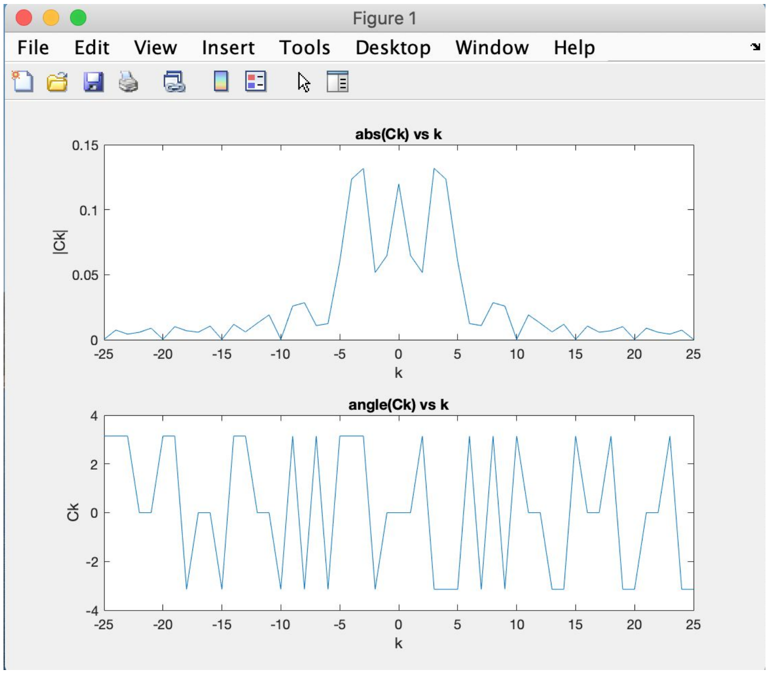


Figure 1
File Edit View Insert Tools Desktop Window Help
abs(Ck) vs k
|Ck|
k
angle(Ck) vs k
Ck
k

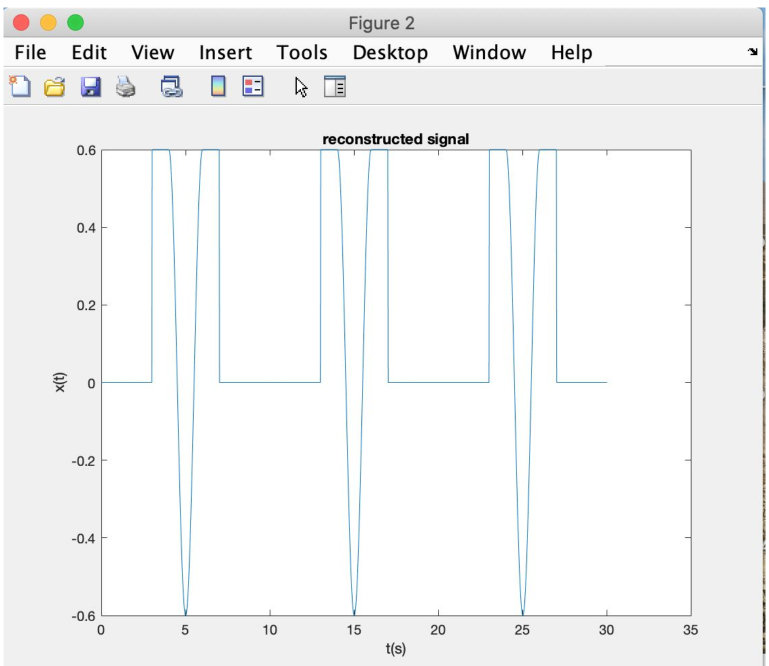
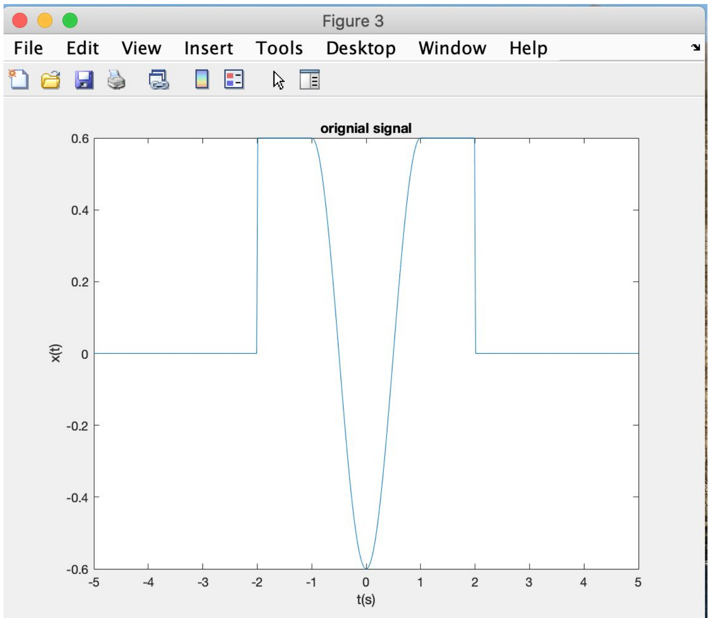


Figure 2
File Edit View Insert Tools Desktop Window Help
reconstructed signal
x(t)
t(s)



- Problem 3:
  For this problem we simply received another matlab file: fs_numerical.m and modified it in order to have the new code produce a real/imaginary approximation as well as the phase and magnitude spectrum. The student was also required to run the original signal through the fourier series exp function which was created in one of the parts above. Personally I had some problems with the manipulation and ended up changing the original file to some different values in order to produce the expected(roughly) function for the approximations meaning that the formulas aren't completely accurate to the true real and imaginary parts of the signal provided in order to make the function more accurate to what was expected

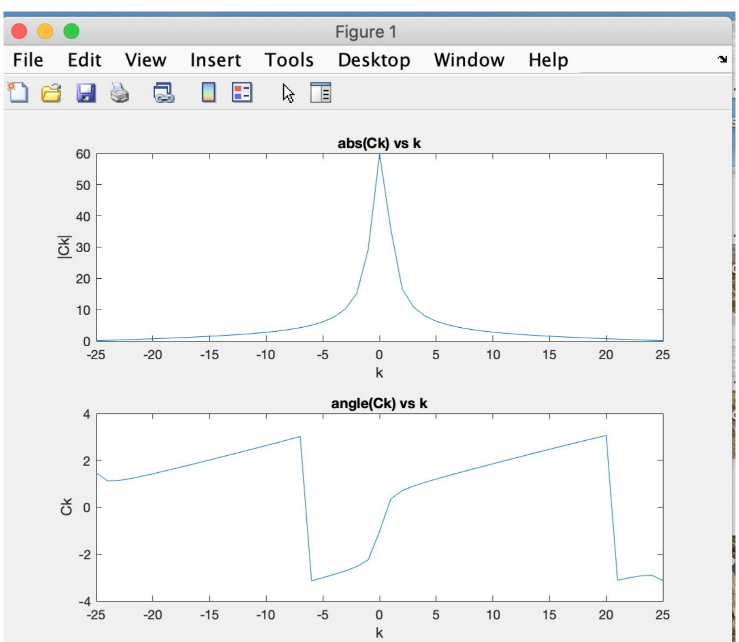


*Figure 4 to the left is the functions provided by using the fourier series exp function these are the abs(CK) vs K and angle(Ck) vs K

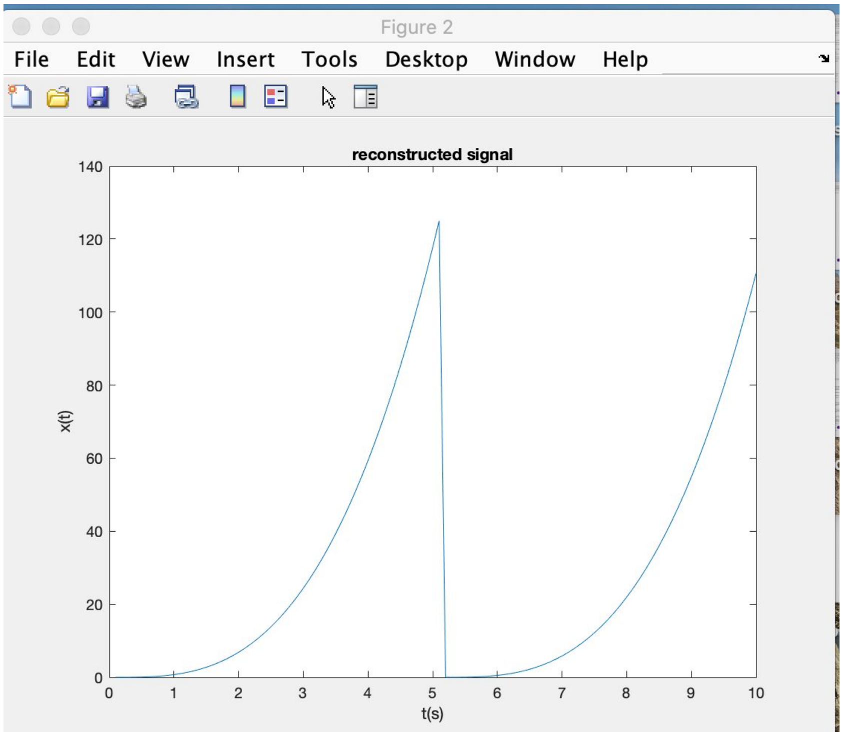


*Figure 5 to the left is another function provided from calling the same function this is the reconstructed signal of z(t)

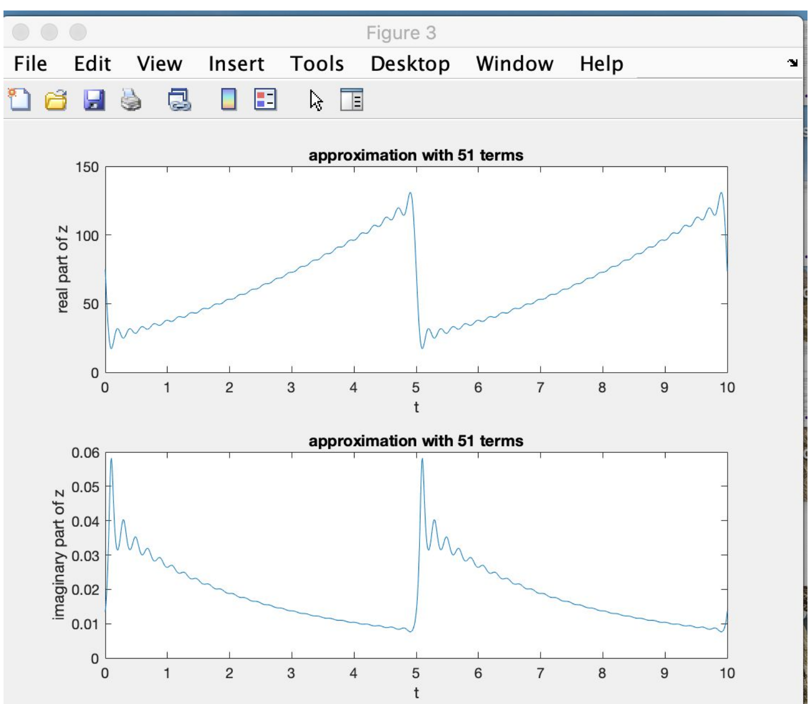


*Figure 6 to the left is the 51 term approximation of both the real and imaginary aspects of z(t) in order to create the expected imaginary function I had to modify the actual function(did an inversion)

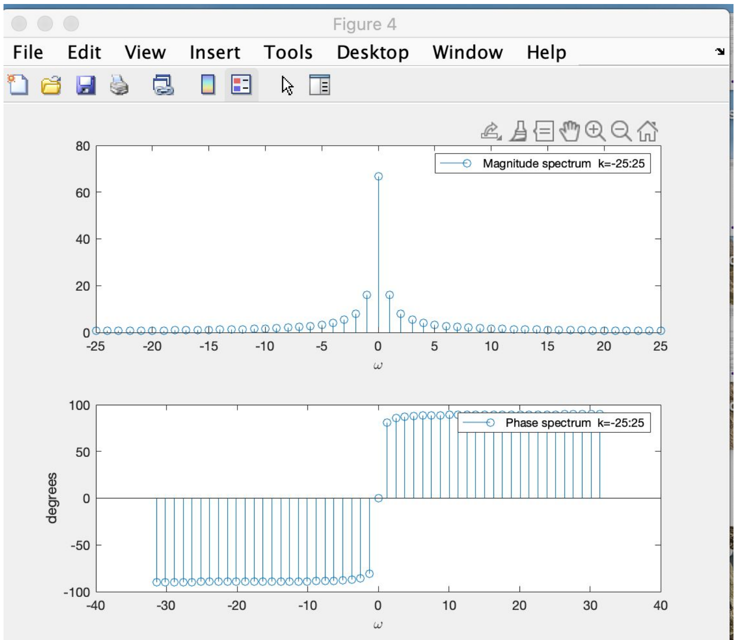


*Figure 7 to the left is the magnitude and phase spectrum from the function z(t)