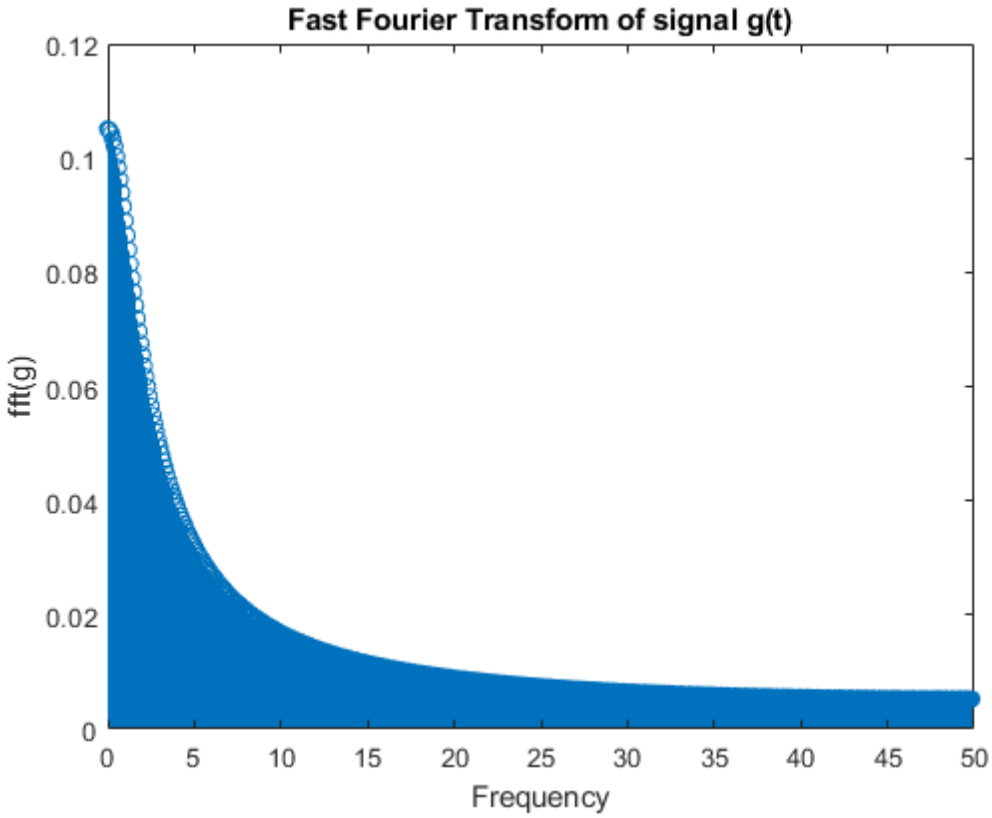
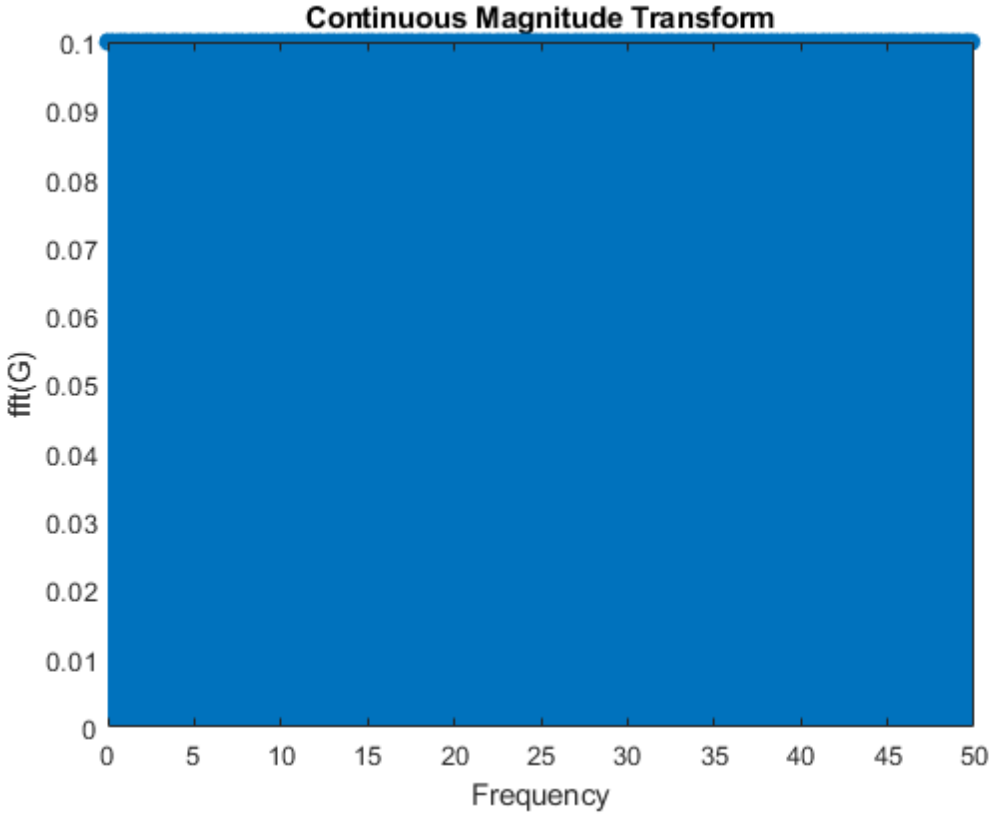
```
% Alberto Pizano
% ECE448
% Lab2 Part 2
% 9/8/2019

clc
clear all
close all

% Unit step function generation
t = 0:0.01:1;
sig = exp(-10.*t); % t = pulse width = 0.1ms
trail = zeros(1,450);
precede = zeros(1,450);
g = [precede sig trail];

% Determine number of points in g(t)
N = length(g); % length is 1000

% To determine the period of T
T = N*0.01

% Fourier transform of g(t)
z = fft(g)*0.01;
figure(1)
stem((0:(N/2-1))*(1/(N*0.01)),abs(z(1:N/2)));
xlabel('Frequency');
ylabel('fft(g)');
title('Fast Fourier Transform of signal g(t)');

% Plot the continuous magnitude transform
f = (0:N/2 -1)* (1/N*0.01);

Gf = (1./(10+1i*2*pi*f)).*(1 - exp(-10 - 1i.*2.*pi.*f));

figure(2)
stem((0:(N/2-1))*(1/(N*0.01)),abs(Gf));
xlabel('Frequency');
ylabel('fft(G)');
title('Continuous Magnitude Transform');
```

```
T =

   10.0100

Warning: Integer operands are required for colon operator when used as index.
```



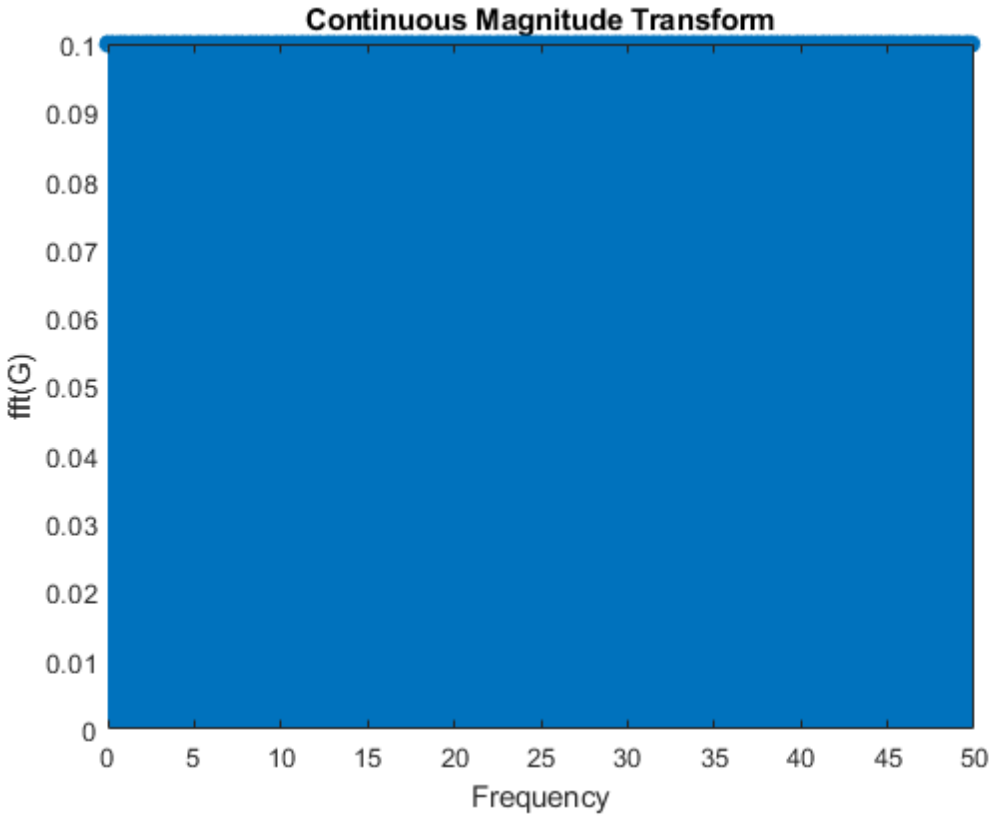


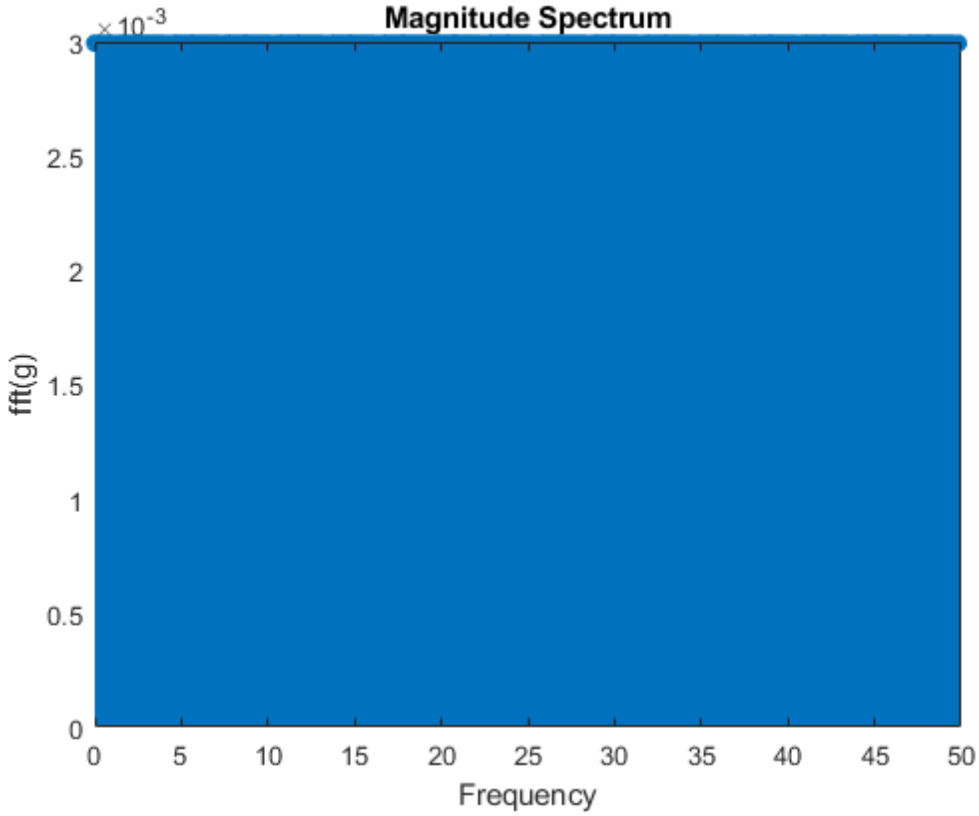
Plot the magnitude spectrum sinc function

```
% Sinc function generation
t2 = 0:0.01:1;
sig = sin(pi.*t2)/(pi.*t2);
```

```
trail = zeros(1,450);
precede = zeros(1,450);
g = [precede sig trail];

% Number of points in g(t)
N = length(g);

% Determine period of T
T = N*0.01

% Fourier transform of g(t)
z = fft(g)*0.01;

figure(3)
stem((0:N/2 - 1)*1/(N*0.01),abs(z(1:N/2)));
xlabel('Frequency');
ylabel('fft(g)');
title('Magnitude Spectrum');
```

```
T =

    9.0100

Warning: Integer operands are required for colon operator when used as index.
```





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