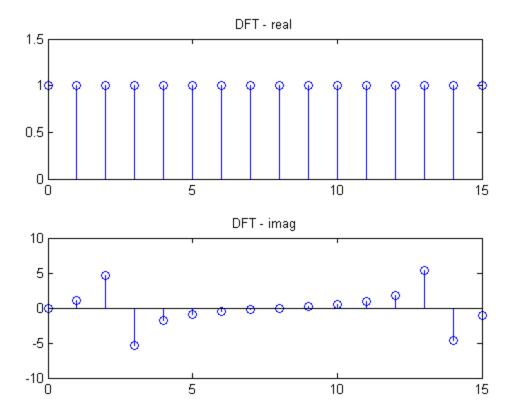
```
%Pratap Luitel
%Engs 92
%HW-2, Problem 6 (3.15 a, b and c )
%Reference: worked on code originally provided by Markus Testorf on 2011-09-16
N = 16;
               % length of signal vector
n = 0:(N-1);
               % vector index
Nc = 500;
                % number of samples for continuous signal approximation
    nu = 2.5;
                 % out of bin sinusoid;
    f = cos(2*pi*nu * n/N);
                                        % sampling the discrete vector elements
    fc = cos(2*pi*nu*(1:Nc)/Nc);
    F = fft(f);
                                        % computing the DFT
    %direct values from f and F vectors
    fprintf('Direct values from f and F vectors\n');
    fprintf('f[0] = %f \setminus n', f(1));
    fprintf('F[0] = fn',F(1));
    %using area theorem
    fprintf('Area Theorem Verification\n');
    fprintf('f[0] = fn', sum(F)/N);
    fprintf('F[0] = fn', sum(f));
    fprintf('Parsevals Theorem Verification \n');
    fprintf('The sum of f[n]^2 where n = 0 to N-1 is: f(n', norm(f, 2)^2);
    fprintf('The sum of (F[n]^2)/N where n = 0 to N-1 is: f^n', (norm(F,2)^2)/N);
    subplot(2,1,1), stem(n, real(F));
    title('DFT - real')
    subplot(2,1,2), stem(n, imag(F));
    title('DFT - imag')
        Direct values from f and F vectors
        f[0] = 1.000000
        F[0]= 1.000000
        Area Theorem Verification
        f[0] = 1.000000
        F[0] = 1.000000
        Parsevals Theorem Verification
        The sum of f[n]^2 where n = 0 to N-1 is: 8.000000
        The sum of (F[n]^2)/N where n = 0 to N-1 is: 8.000000
```

1



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