Example given in class related to Problem 9 in HW 4. (February 2016 mfi)

```
clear all; close all;   %clear all variables and closes all figure windows
%20s time axis, sampled at T=0.01s,c = 1s, and u0=1/2c=0.5 Hz
t=-10:0.01:10;c=1;u0=1/(2*c);tt=t(501:1501); %the central 10 s of time axis
h=zeros(size(t));h(951:1051)=1;%h=psf of meas; 1s rect function with area=1
f=2*cos(2*pi*u0*t);     % f=object function of freq=u0 and amplitude=2
plot(tt,f(501:1501),tt,h(501:1501),'r');hold on %plot object function and psf
g=conv(h,f,'same')*0.01;      %convolve h and f and scale by T=dt=0.01s
plot(tt,g(501:1501),'k');hold off   %plot the measurement g on same axes
%
%Here I describe how to make an H matrix that performs the convolution
N=12;h=zeros(1,N);h(1:3)=1/6;h(10:12)=1/6;%simplify to 12pt h; area=1.
% Construct the H matrix
H(1,:)=h;   %first row of H is h.
for j=2:N   %other rows are shifted versions of the first row
    H(j,j:N)=h(1:N-j+1);H(j,1:j-1)=h(N-j+2:N);
end
imagesc(H);colormap gray; axis square     %image the H matrix
f=2*cos(2*pi*[1:12]/12)';     %make a new (smaller) object function
g=H*f; %generate data via convolution as a matrix multiplication
figure;plot(f);hold on;plot(g,'k');hold off
%
```