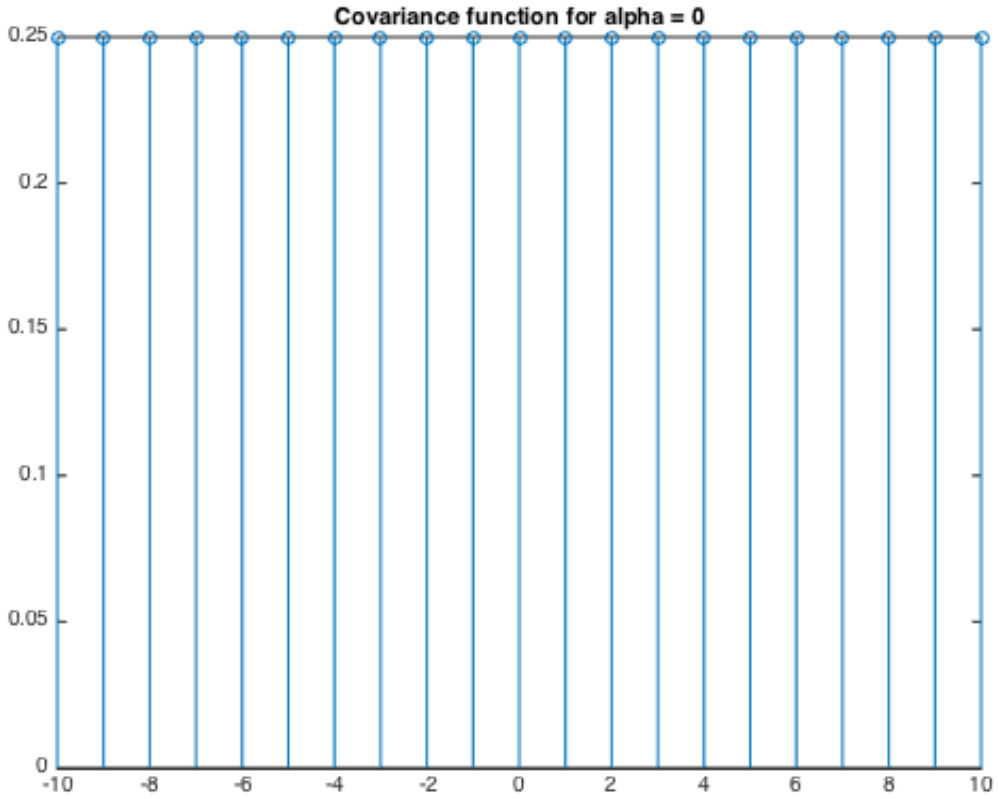
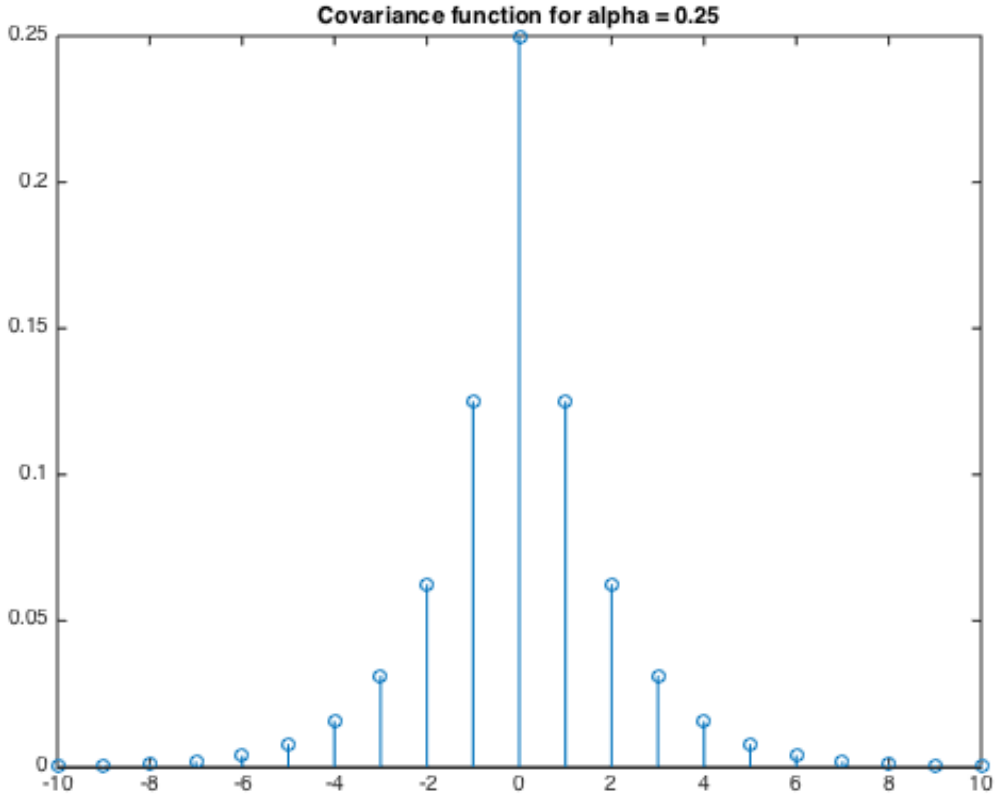
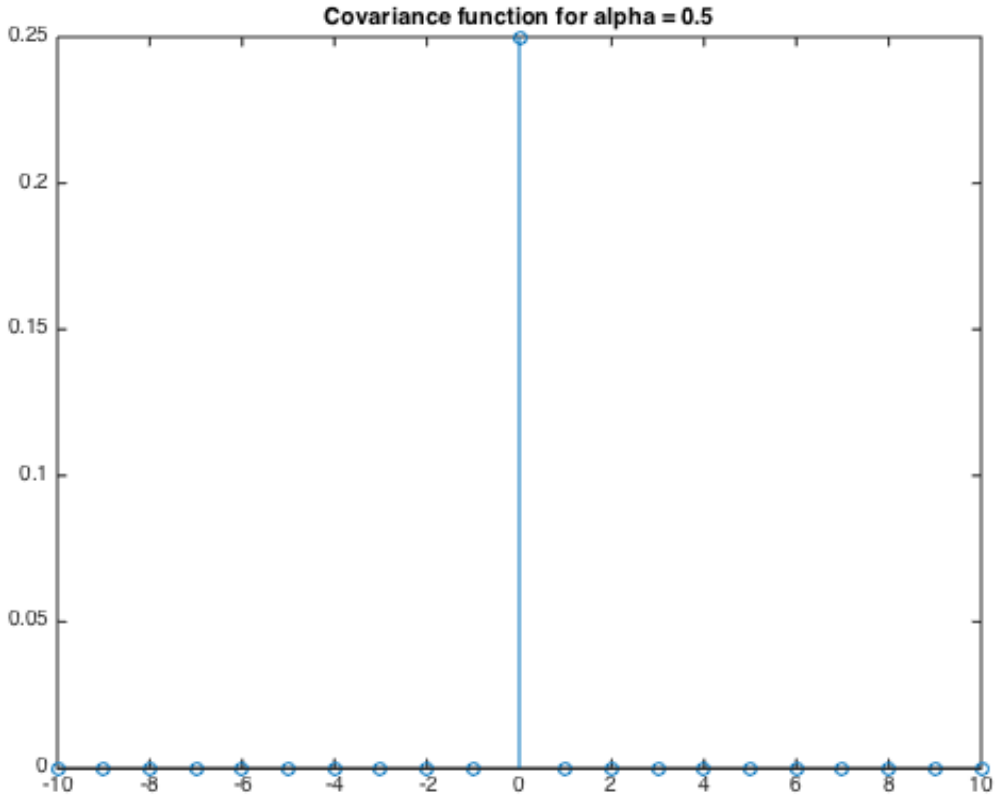
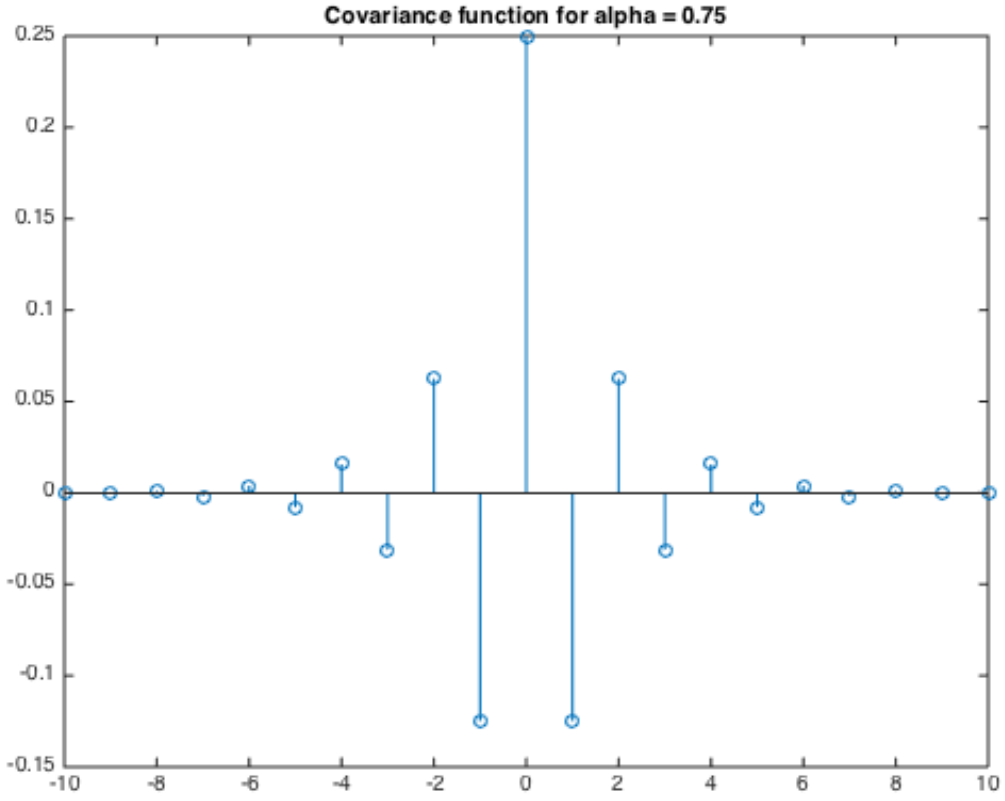
```
alpha = [0, 0.25 0.5 0.75];

m = -10:1:10;

for i = 1:length(alpha)
    CovFunc(i, :) = 1/4*(1-2*alpha(i)).^(abs(m));
end

figure; stem(-10:1:10,CovFunc(1,:));
title('Covariance function for alpha = 0');
figure; stem(-10:1:10,CovFunc(2,:));
title('Covariance function for alpha = 0.25');
figure; stem(-10:1:10,CovFunc(3,:));
title('Covariance function for alpha = 0.5');
figure; stem(-10:1:10,CovFunc(4,:));
title('Covariance function for alpha = 0.75');

% The plots agree with what we expect of this system. When alpha is 0 this
% means that there is no transition probablility and therefore knowing the
% first value, gives you complete information about all future and past
% values.

% When the alpha is 0.25 we start seeing a covariance function that we
% typically expect. One where the covariance of two times decreases as time
% goes on.

% When the alpha is 0.5 the system is as random as it can be. Therefore we
% gain no information about future or past values. This is reflected by
% only seeing a spike at m=0 and the rest of the values being 0.

% When alpha is 0.75, the system acts differently. Because the transition
% probability is so high, you are very likely to switch states during a
% time step. This corresponds to flipping signs of the covariance function
% at every time step. Which is what we see.
```


Covariance function for alpha = 0
0.25
0.2
0.15
0.1
0.05
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


Covariance function for alpha = 0.25
0.25
0.2
0.15
0.1
0.05
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


Covariance function for alpha = 0.5
0.25
0.2
0.15
0.1
0.05
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


Covariance function for alpha = 0.75
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-10
-8
-6
-4
-2
0
2
4
6
8
10

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