Digital Signal Processing
Experiment 02

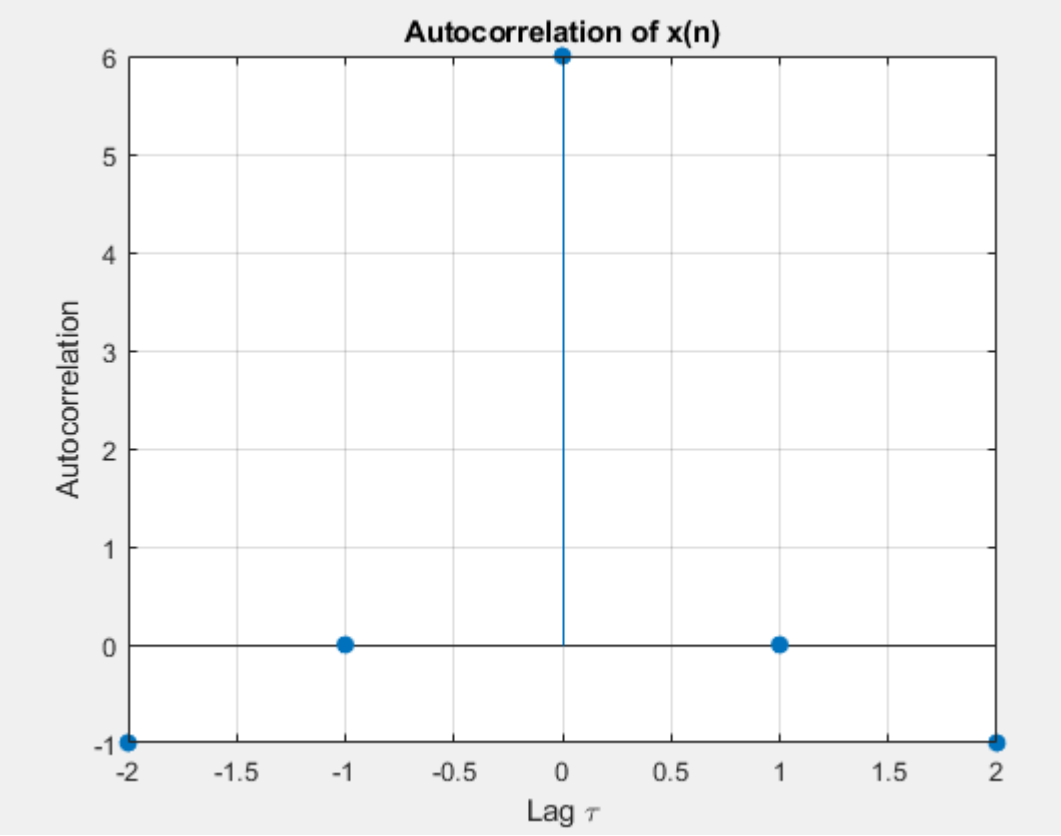
Auto Correlation:

```
x = [-1, 2, 1];
[auto_corr, lags] = xcorr(x, x);

% Plot the autocorrelation
figure;
stem(lags, auto_corr, 'filled');
title('Autocorrelation of x(n)');
xlabel('Lag \tau');
ylabel('Autocorrelation');
grid on;

% Display the result
disp('Autocorrelation values:');
disp(auto_corr);
```

```
>> autocorrelation
Autocorrelation values:
    -1     0     6     0    -1
```



Cross Correlation:

```
x1 = [-3, 2, -1, 1];
x2 = [-1, 0, -3, 2];

% Compute the cross-correlation of x1 and x2
[r, lags] = xcorr(x1, x2);

% Plot the cross-correlation
figure;
stem(lags, r, 'filled');
title('Cross-Correlation of x1(n) and x2(n)');
xlabel('Lag \tau');
ylabel('Cross-Correlation R_{x1,x2}(\tau)');
grid on;

% Display the result
disp('Cross-Correlation values:');
disp(r);
```

```
>> autocorrelation
Cross-Correlation values:
   -6.0000   13.0000   -8.0000    8.0000   -5.0000    1.0000   -1.0000
```