

Gabriel Emerson

ELEC 3800 – project 5

Due: 11/16/21

1. Find the sample mean using the MATLAB function mean.

Code:

```
samplemean = mean(x)
```

Answer:

```
samplemean = 1.5249
```

2. Calculate the estimated autocorrelation function using Eq. 6-15 in the text and plot with appropriate values along the tau axis in units of ms.

Code:

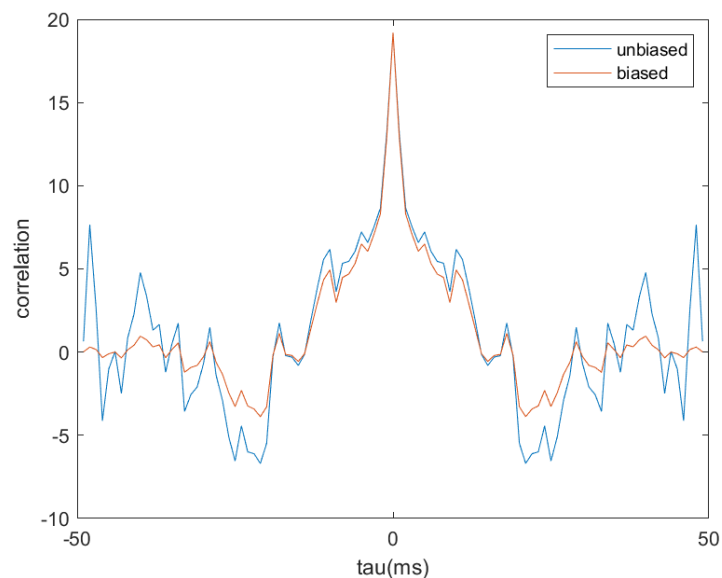
```
[c,lags] = xcorr(x,'unbiased');  
plot(lags,c)
```

3. Calculate the estimated autocorrelation function using Eq. 6-16 in the text and plot with appropriate values along the tau axis in units of ms.

Code:

```
[c,lags] = xcorr(x,'biased');  
plot(lags,c)
```

Plot for 2 and 3



4. Explain why the values in #2 vary so much for large n compared to the same values of n in #3. Are these values in #2 a reliable indicator of the actual autocorrelation? Why or why not?

Answer: The values in #2 are larger because it is unbiased, and therefore has a higher variance. I believe the values in #2 are still reliable, as they are still close to the values in #3. You can see that the unbiased graph trends are similar to those of the biased graph, but it spikes in different locations. However, I think the values in #3 are more reliable because it is biased and has a smaller variance. (The values are closer to their true values)