

EE2703 : Applied Programming Lab

Assignment 3: Fitting Data To Models

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Q4

The function $h(t,A,B)$ is defined and the graph for $f(t)$ with noise is generated

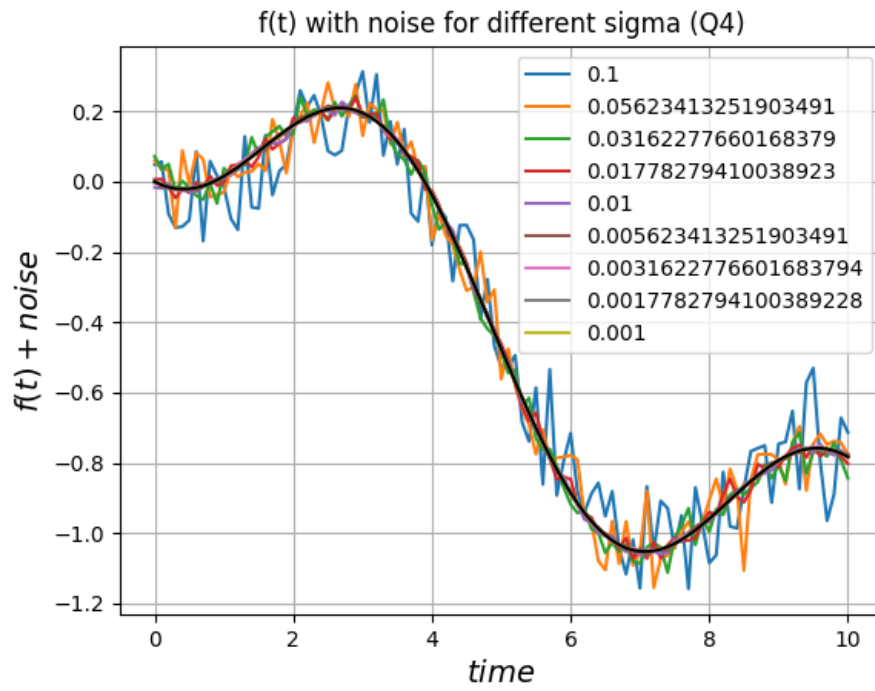


Figure 1: $f(t)$ with noise for different σ

Q5

The plot in Figure 2 indicates the difference between the exact curve and the data which contains the noise corresponding to $\sigma=0.10$

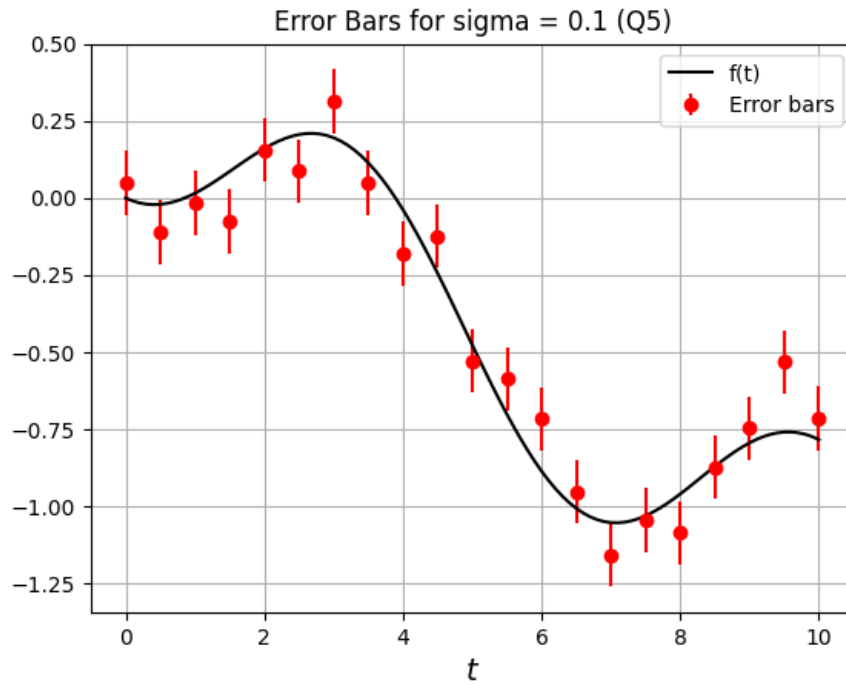


Figure 2: Error Bars for $\sigma=0.1$

Q8

The contour plot of the mean squared error versus the parameters A and B is given in Figure 3. We can see that single minima at the indicated point in the plot.

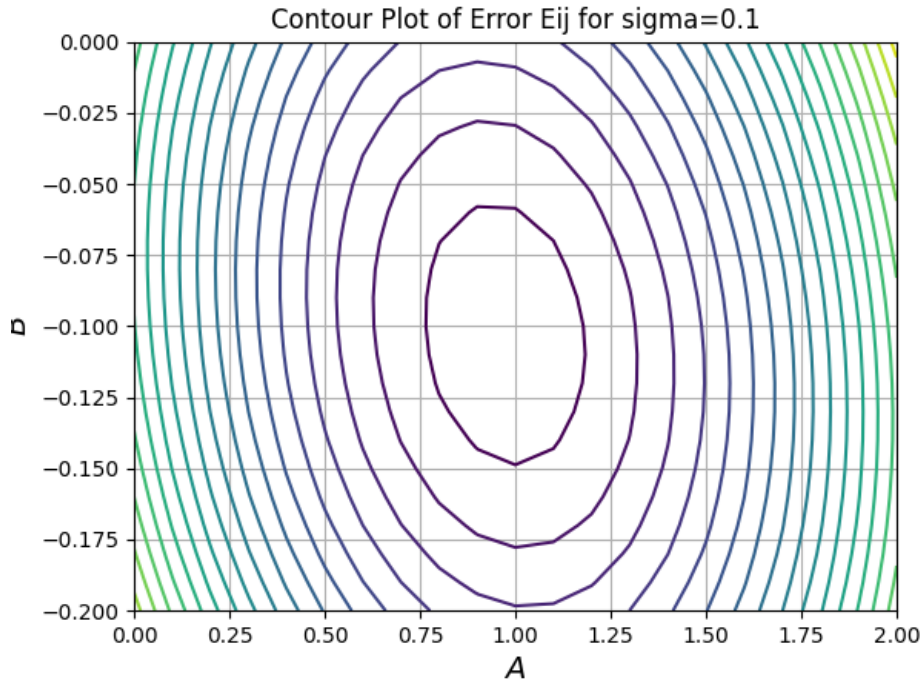


Figure 3: Contour plot for $\sigma=0.1$

Q10

The error in A and B from original values A_0 and B_0 is plotted below and the mean squared error values $\inf f(t)$ are calculated using corresponding column in fitting.dat and f .

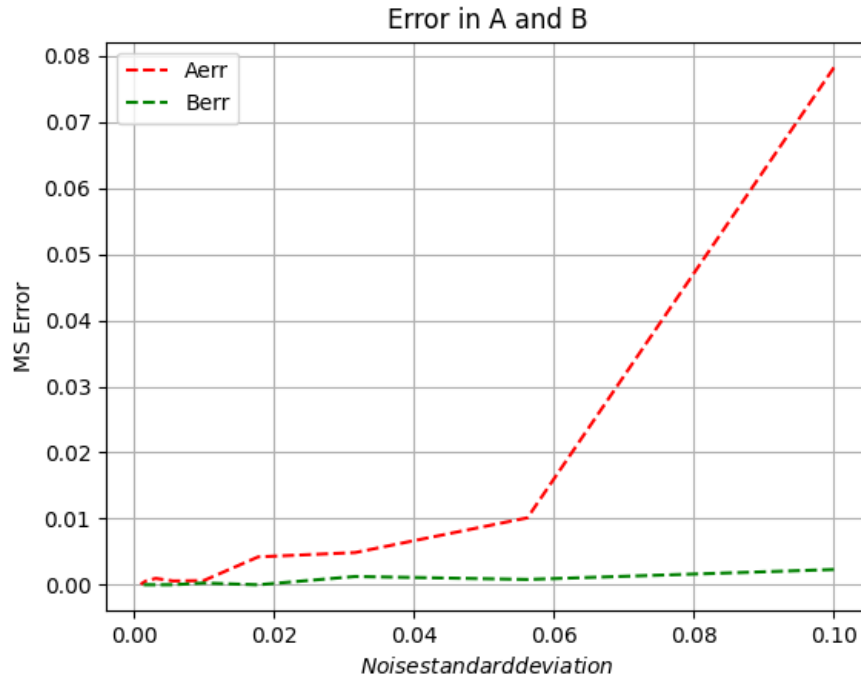


Figure 4: Aerr and Berr for different σ value.

Q11

The final plots for Error on y-axis and σ on x-axis.

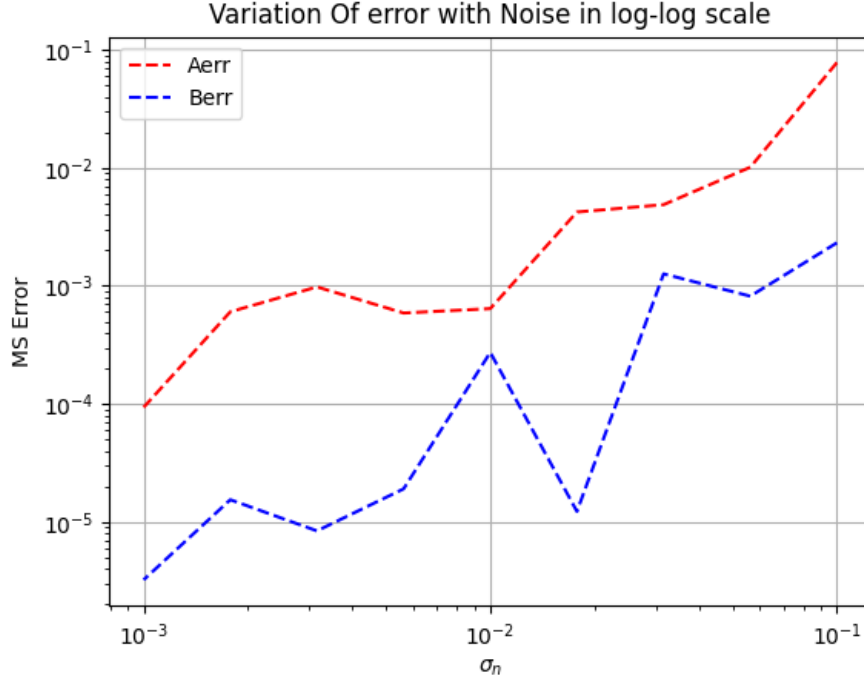


Figure 5: Log-Log Plot

Conclusion

We first generated a random input using generate.py and generate fitting.dat file which stores the inputs.

After loading fitting.dat, we find error bars and plot them.

We will develop a matrix to check whether the product of it and the coefficients equals the function value.

We also plotted error and noise in log-log scale as well