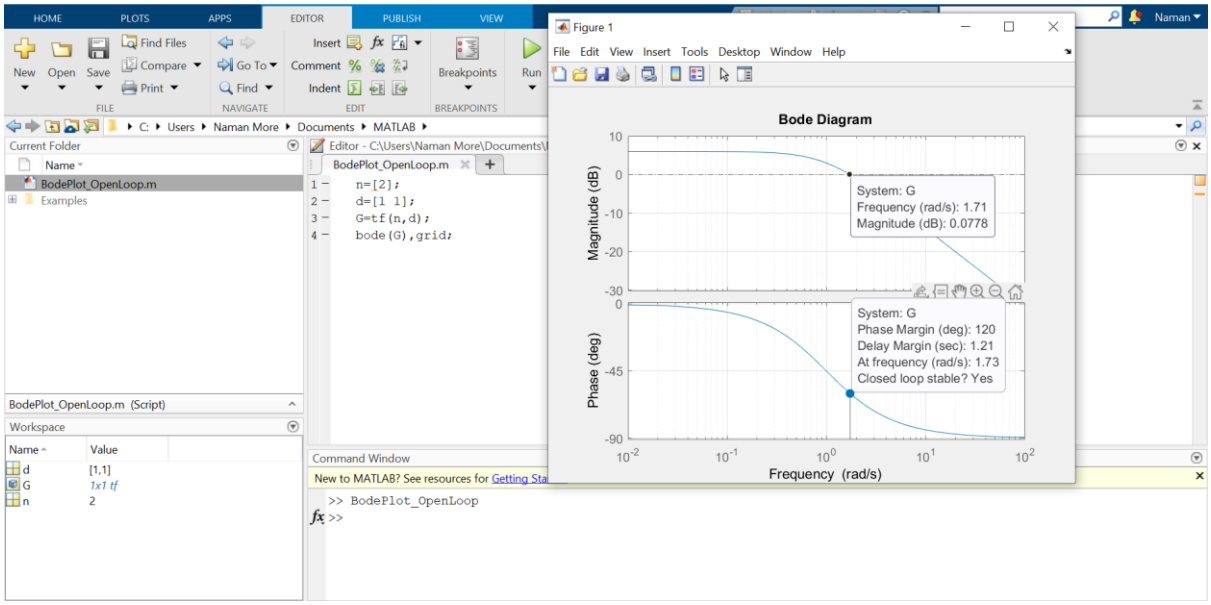
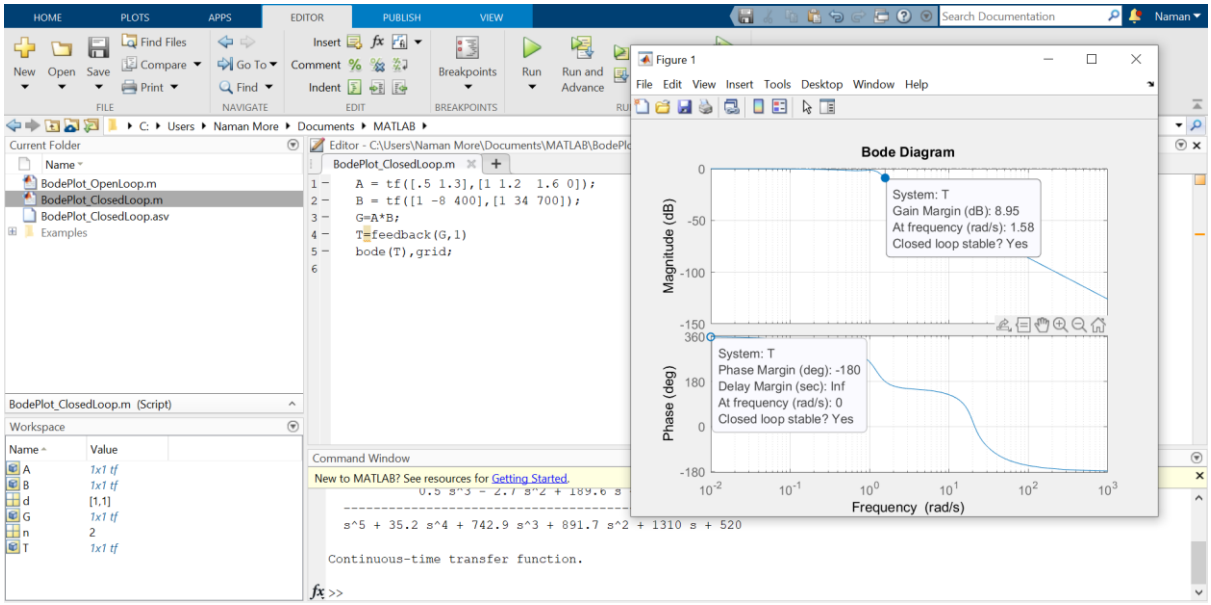
BODE PLOTS

Bode Plots are used to represent the graphs of 2 parameters – Amplitude/Magnitude vs Frequency and Phase vs Frequency for the output signals of a control system.

The Bode Plots are basically the frequency response of the input signals, but the important thing to note here is that the response is based on the transfer function and accordingly the gain and phase shift takes place.



OPEN LOOP SYSTEM

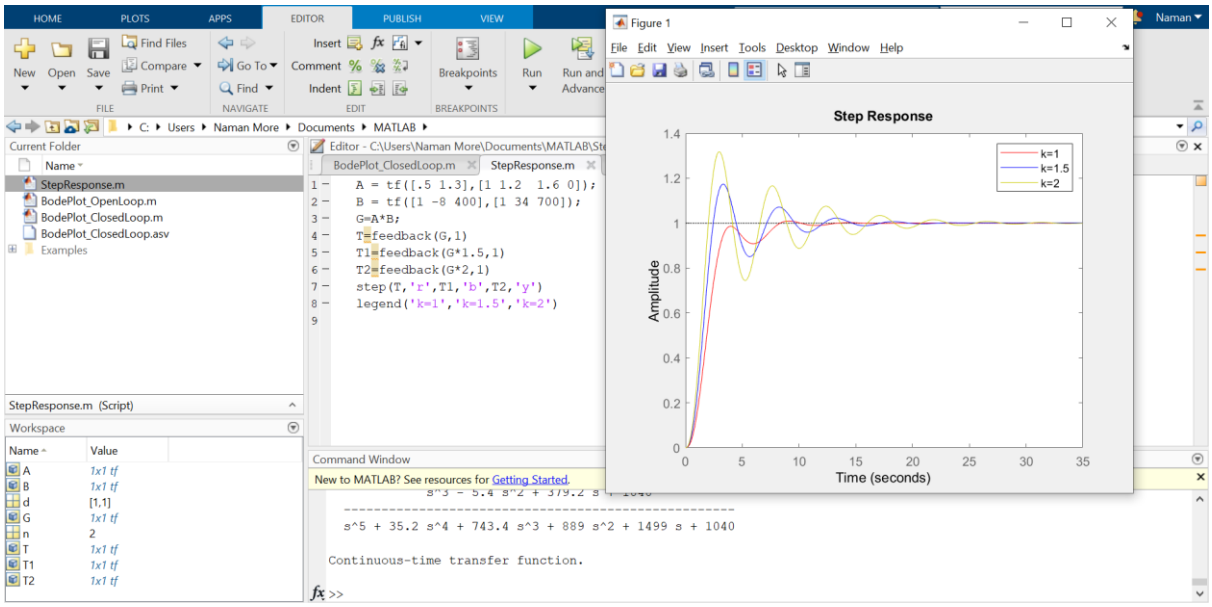


CLOSED LOOP SYSTEM

Difference between closed loop and open loop is that the closed loop system depends on the feedback of the system and accordingly decreases the gain or increases it and the transfer function is thus varied.

STEP RESPONSE

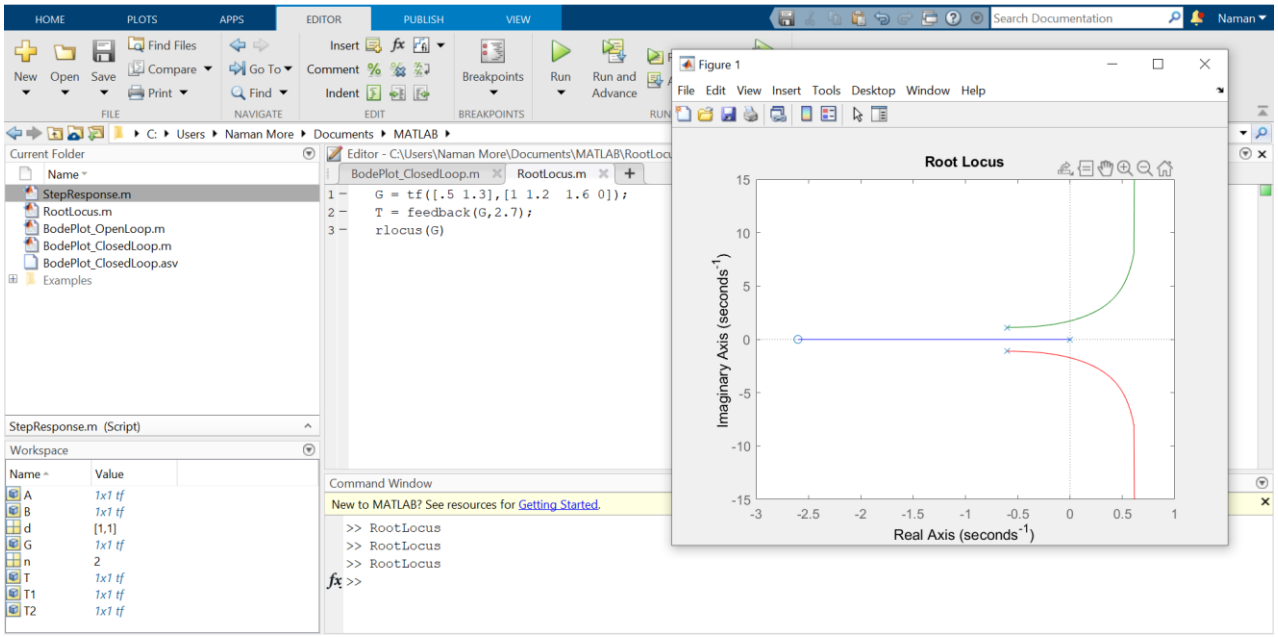
Step response is the time behaviour of the outputs of a general system when its inputs change from zero to one in a very short time.



STEP RESPONSE FOR CLOSED LOOP SYSTEM

ROOT LOCUS

Root locus is a graphical method which signifies the stability of a closed loop system by making it evident that how much the loop gain can vary before the system loses its stability. So, in a system with feedback, one can change one or more system parameters keeping in mind the total value for stability.



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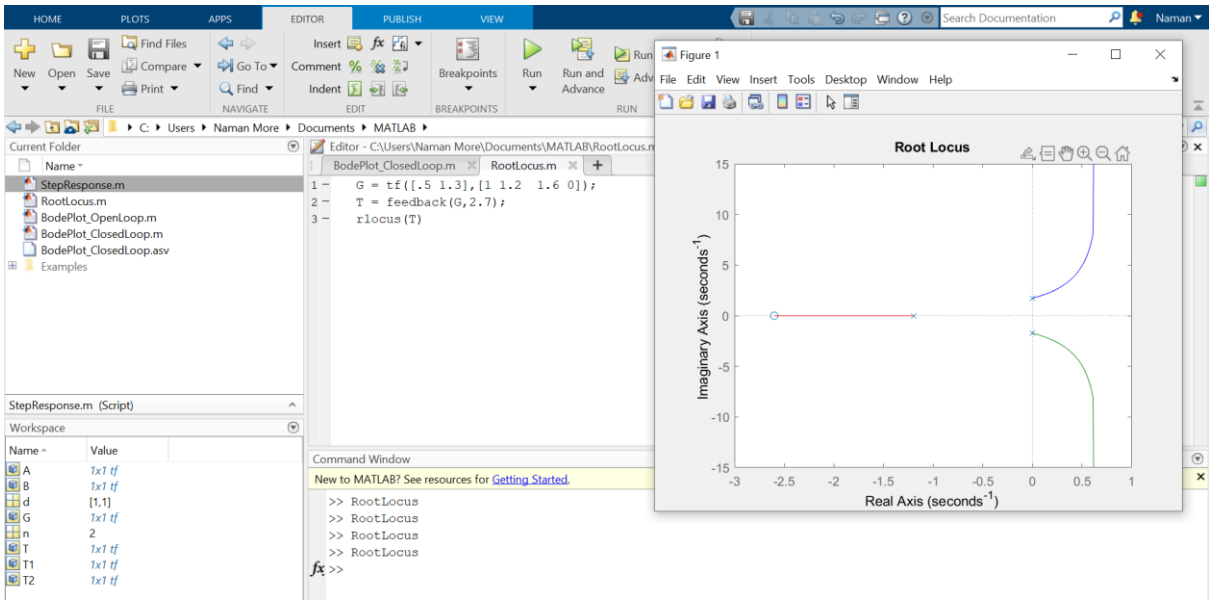
This is the root locus plot of the system considering only the transfer function and neglecting the feedback. Through this, I found out that the maximum gain in the feedback part of this system is 2.7 after which it becomes unstable.



So, here after providing a negative feedback of 2.7, we see that the system can no longer afford to have more gain and is in its stable state.