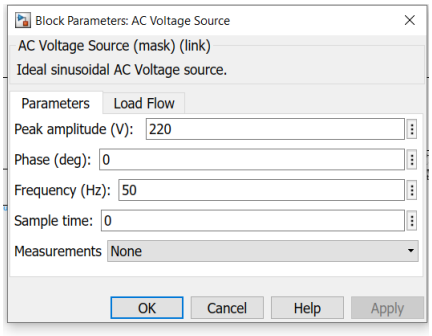
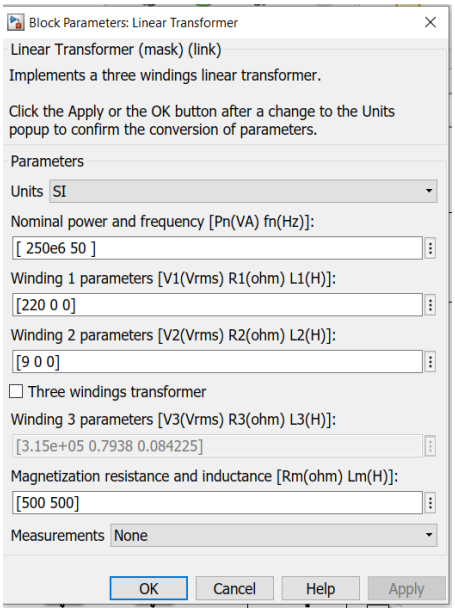
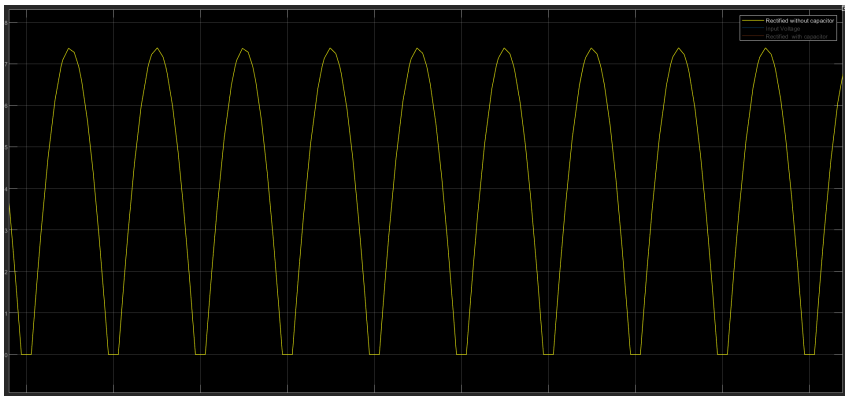
The AC current is set at 220V and the transformer is set to transform it to 9V as shown below. The rectifier then turns it to 9V DC.

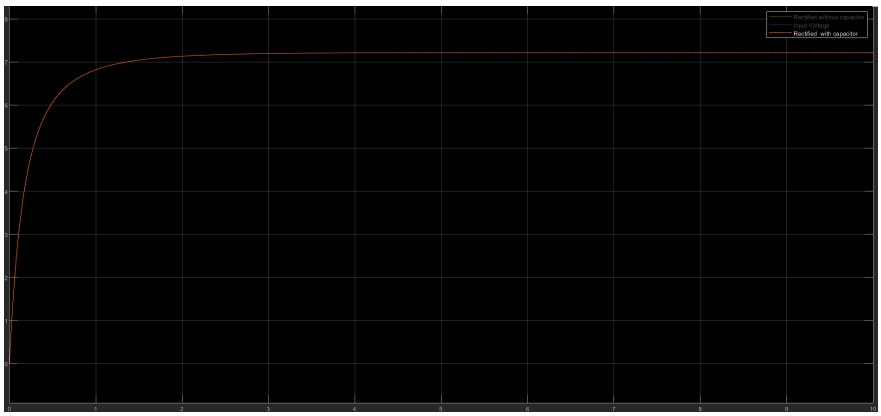




When we run the simulation without the capacitor, the output graph is a repetition of the top(positive) half of a sort of sinusoid curve - in other words, a pulsating DC.

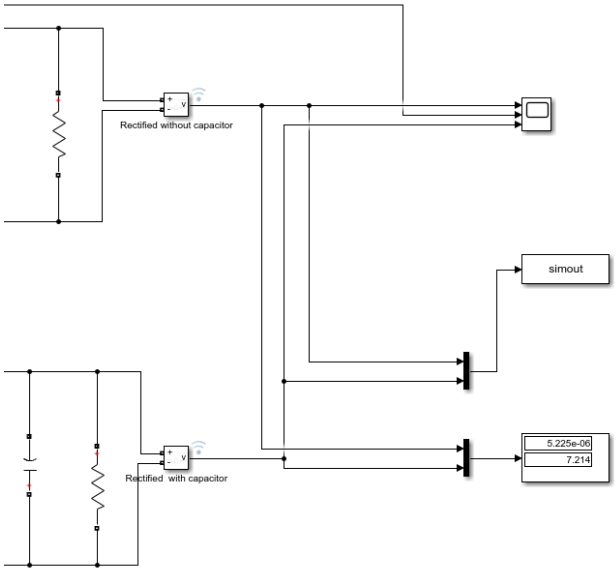


When we add a capacitor and then run the simulation, the curve gets smoother as we increase the capacitance. At around 50F the curve increases at first and becomes a straight line representing a plain DC current with minimal ripple.

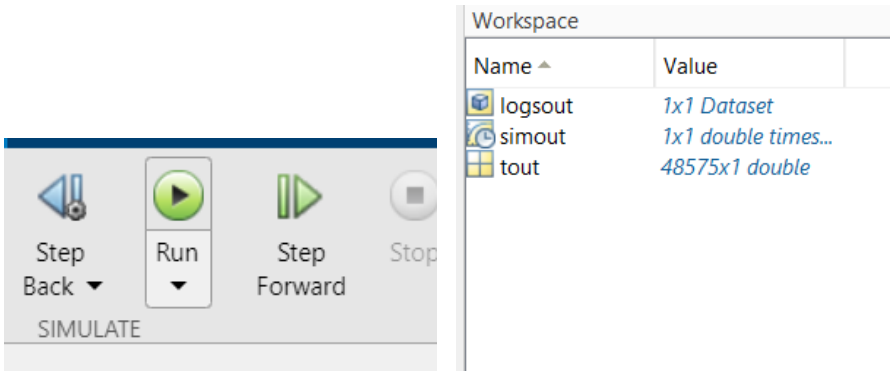


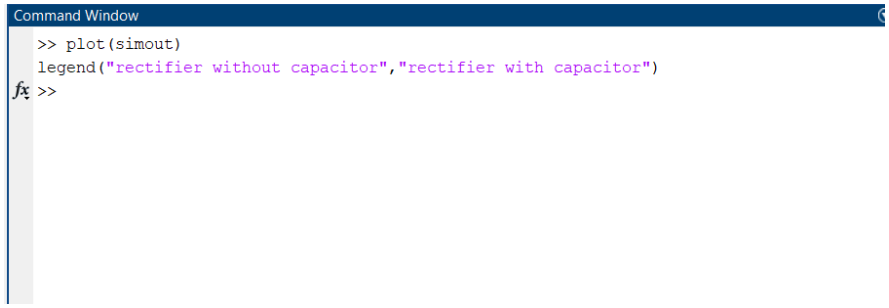
The voltage across the resistive loads in both cases(without and with capacitor) are processed through a multiplexer(MUX) block to the workspace in the form of timeseries via the simout variable.

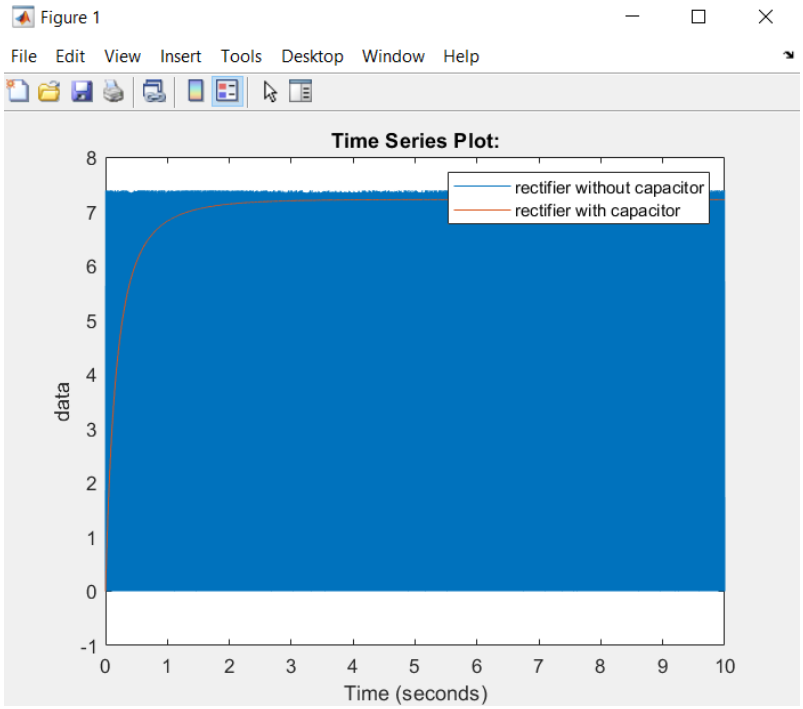
We can see the graph using scope and the voltage values on the display as well.



After running the simulation in Simulink and initializing the variables, in order to get the plot in MATLAB with legend we run the commands that I have provided in the fullwave.m file.







This is the output in MATLAB along with the legend.