Open-loop vs closed-loop(first-order)

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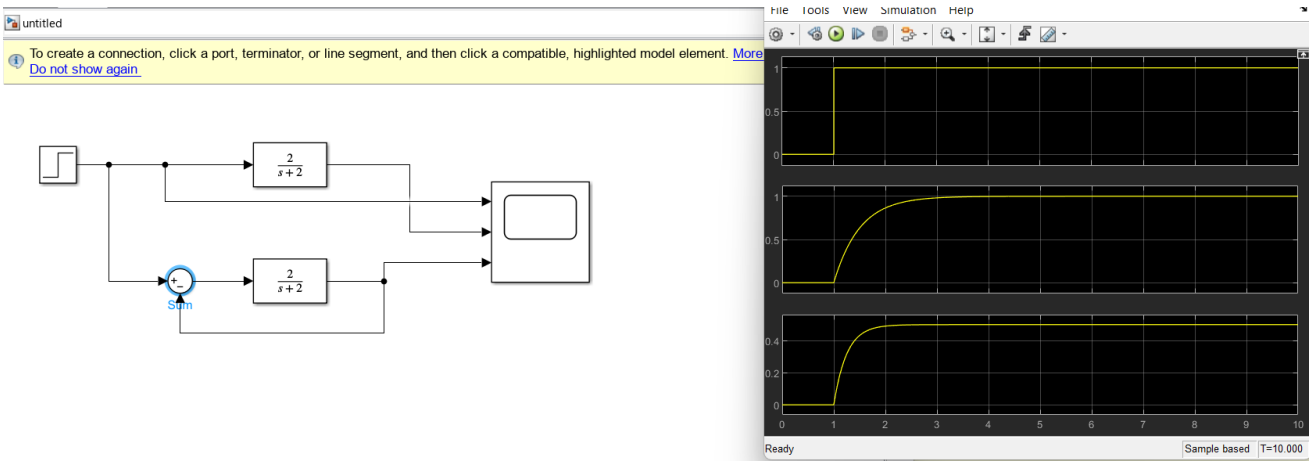
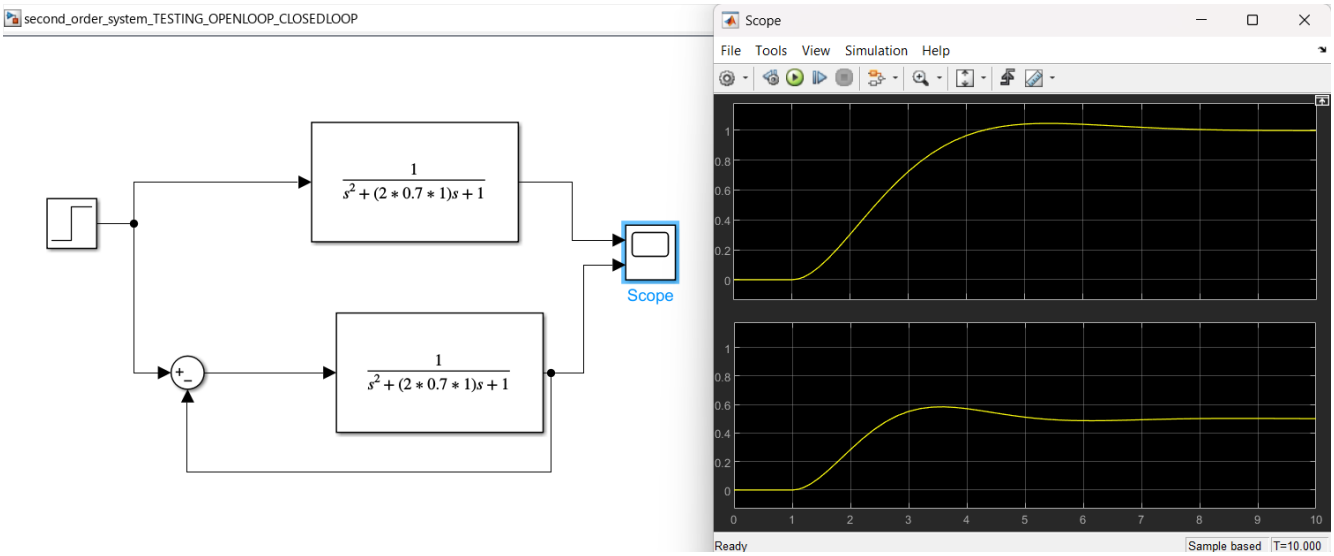
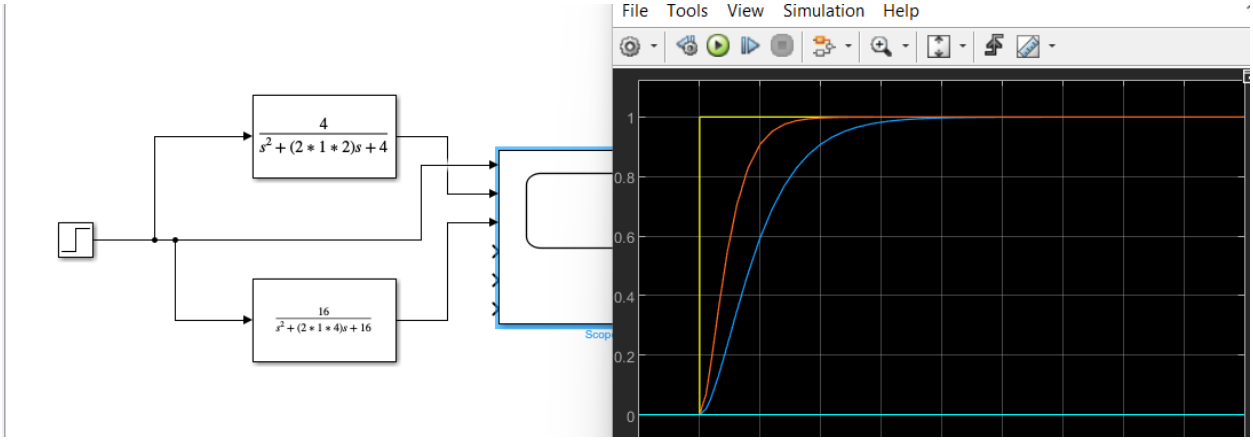


->As you see in the results the open has a reached a final of 1 and the closed loop has reached a value of 0.5 and stabilizes in it since there is feedback which indicates that feedback decreases time constant and increases the system response.

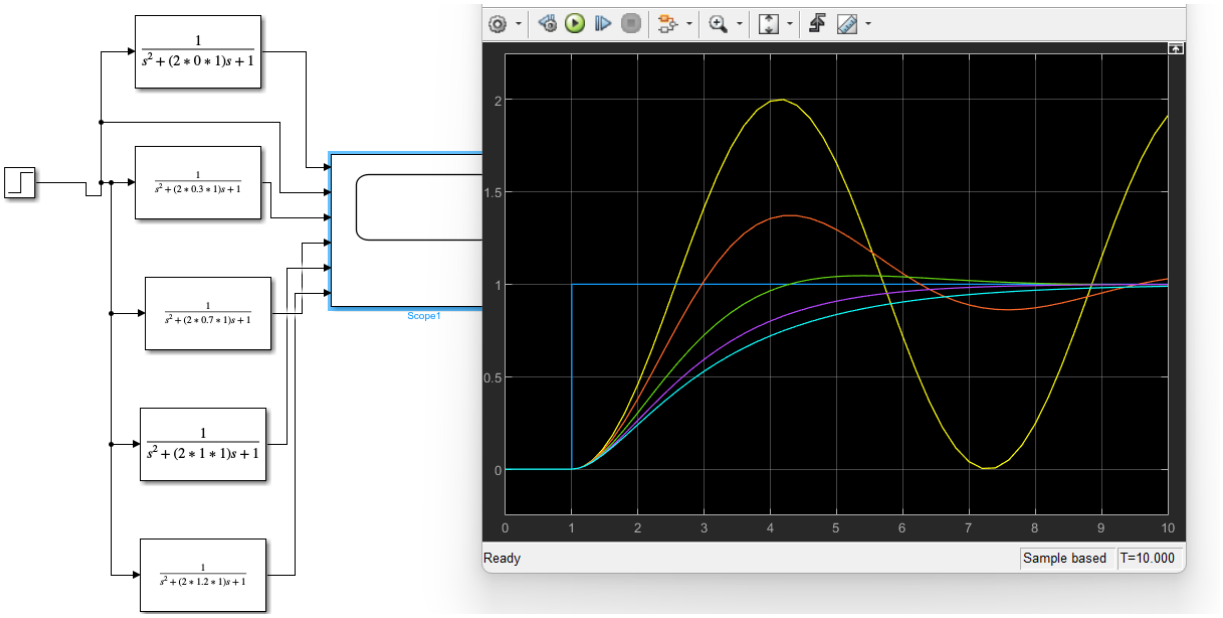
Open-loop vs closed-loop(second-order)



→As you see here in closed-loop the time constant decreased and the system response increased and there is steady state error



->Different Wn values affectes also as the wn increases the time constant decreases and the responses becomes faster e can see the difference in two values at the scope one for wn 4 and other 2the red one for 4 and the blue one for 2



->Diffenet values of zeta also the yellow graph for zeta equal to zero the red graph for zeta equal 0.3 the green one for zeta equal to 0.7(underdamped) and zeta equal to 1 for purple(critically damped) and zeta equal to 1.2 for the blue one (over damped)

So in conclusion the open loop system we un able to control the output or monitor since there is no sensor feedback to monitor the output while in closed loop we solved the issue by adding a feedback to monitor the output