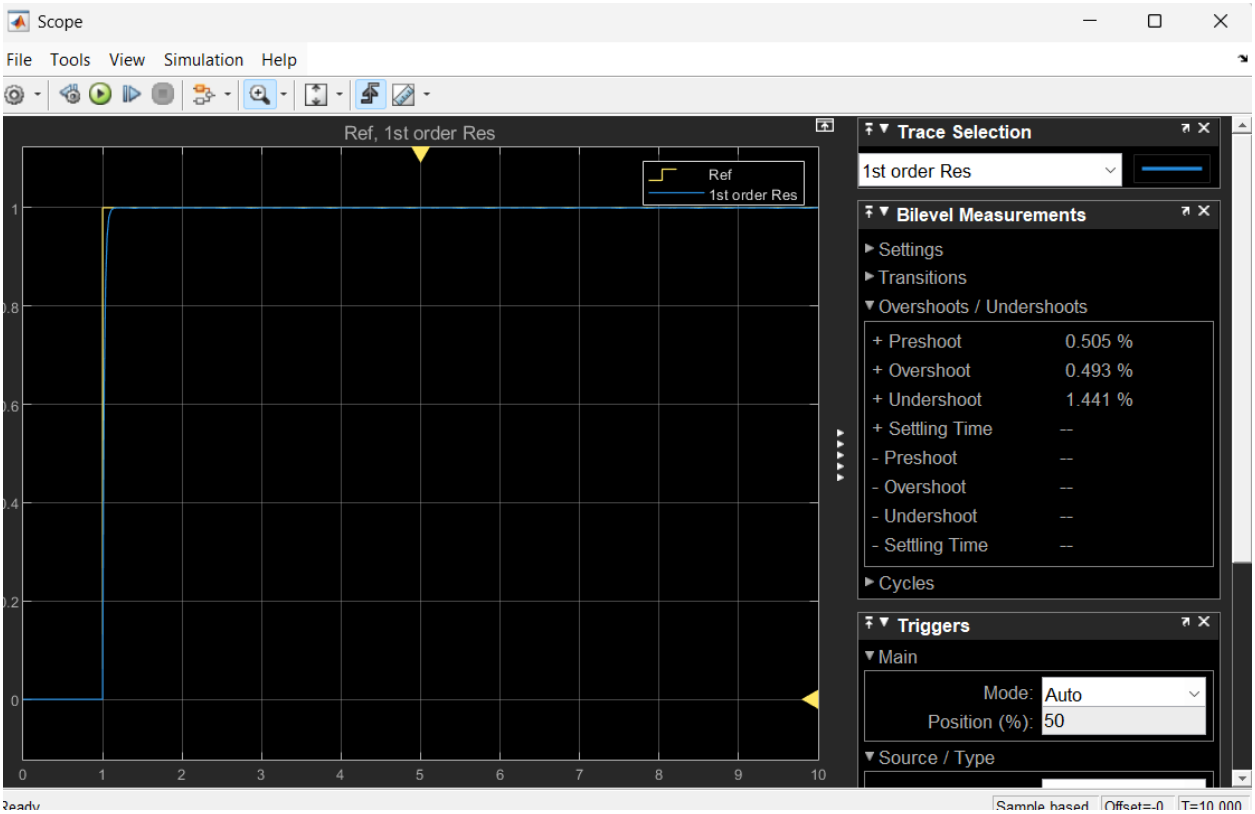
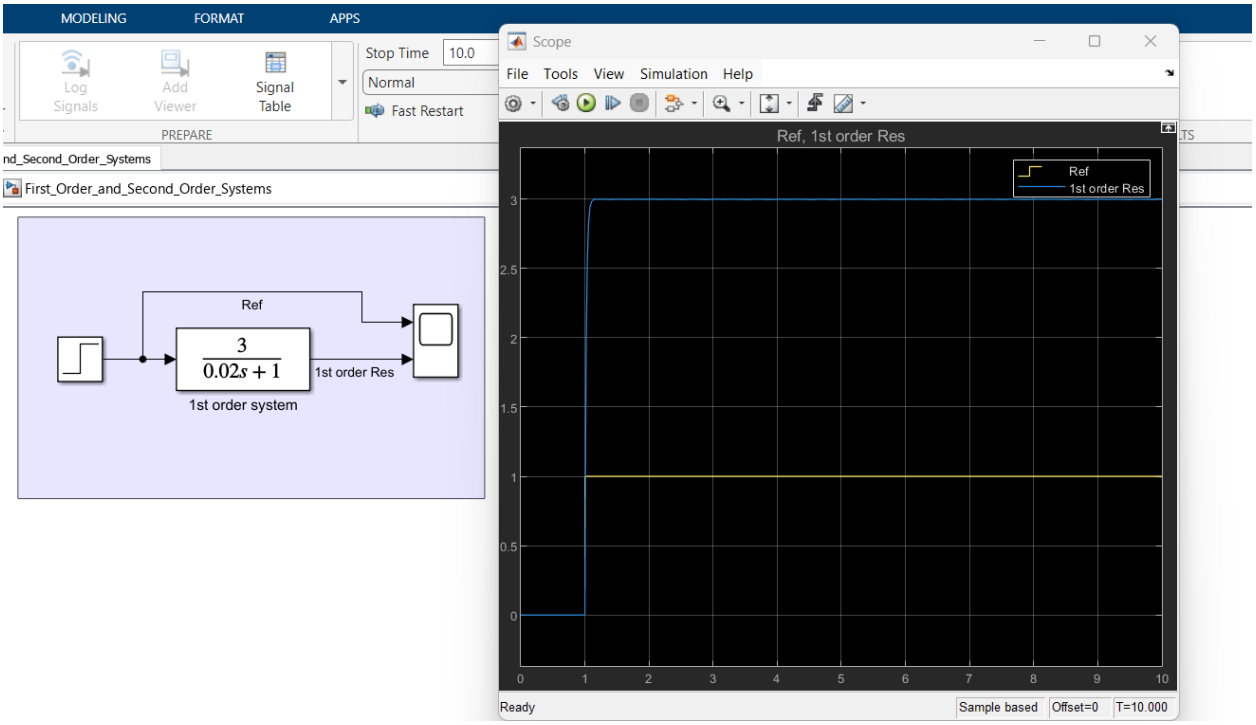
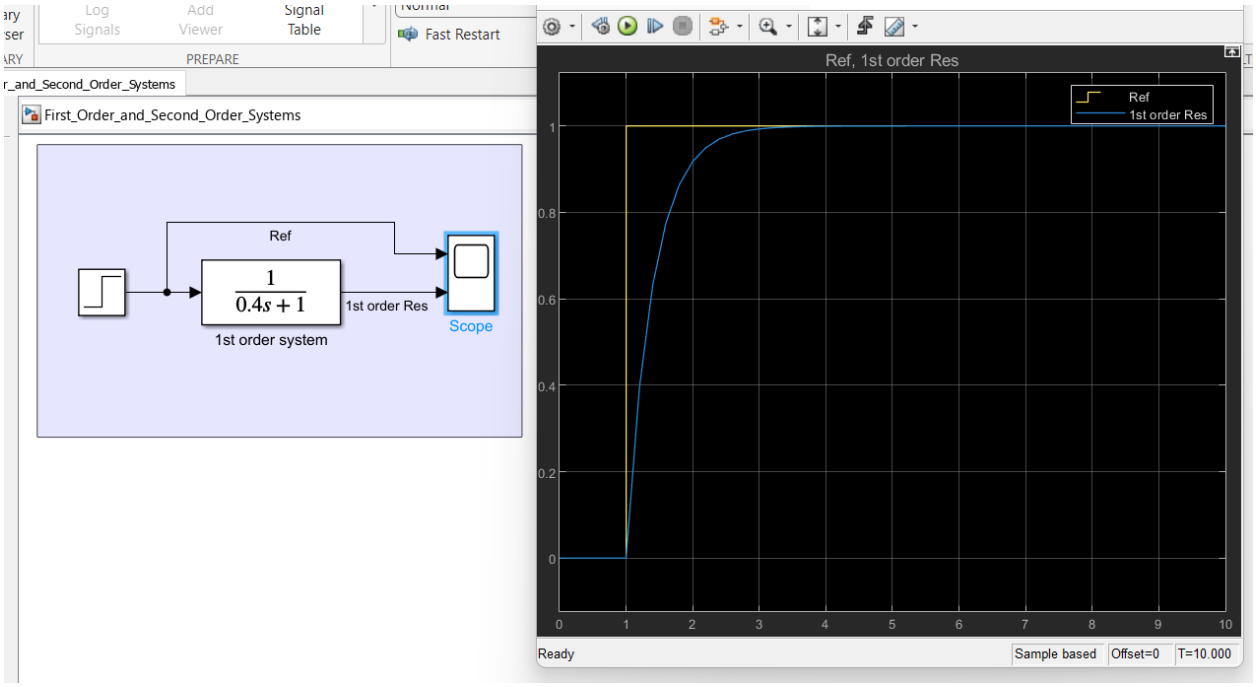
Part 1: First-Order System (No Overshoot)

```
%% Part 1: First-Order System
K= 1;
T= 0.02;
num=[K];
den=[T 1];
G=tf(num,den)
```

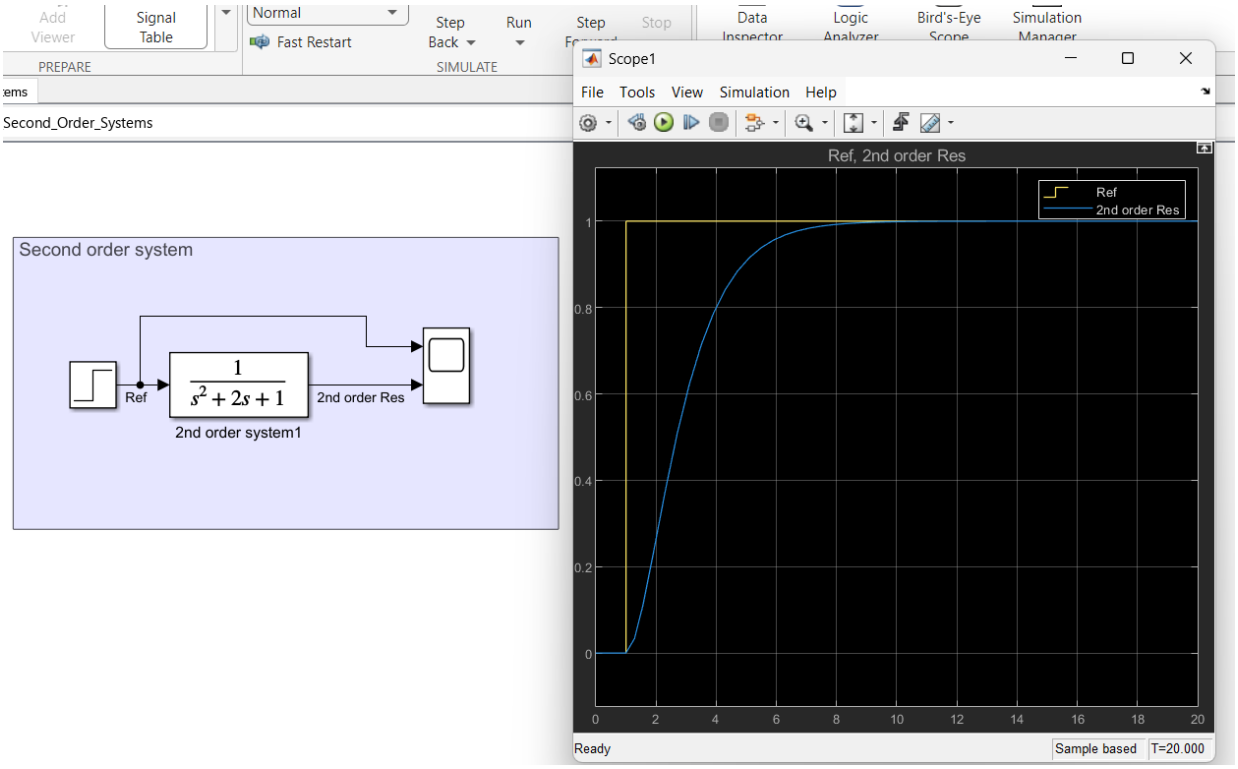
```
>> First_order_2nd_order_Lab

G =

      1
  ----------
  0.02 s + 1

Continuous-time transfer function.
Model Properties
>>
```



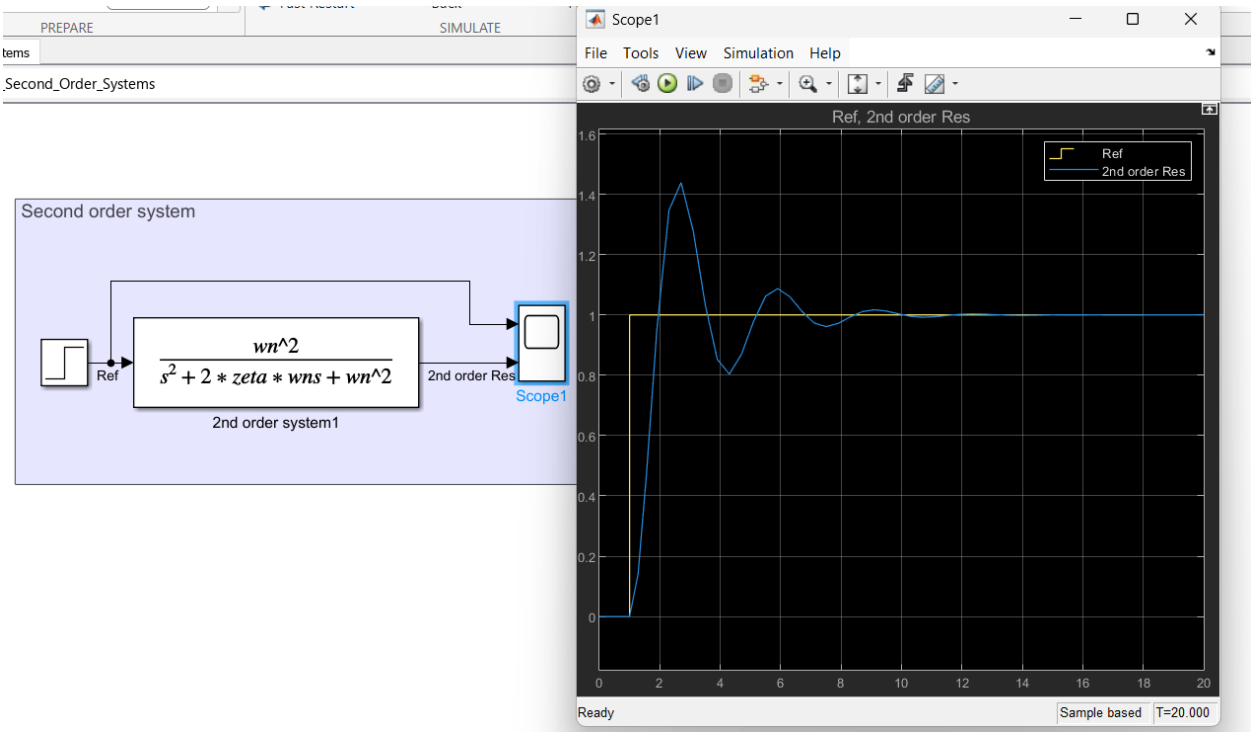

MODELING
FORMAT
APPS
Log Signals
Add Viewer
Signal Table
PREPARE
Stop Time
10.0
Normal
Fast Restart
nd_Second_Order_Systems
First_Order_and_Second_Order_Systems
Ref
3
0.02s + 1
1st order Res
1st order system
Scope
File Tools View Simulation Help
Ref, 1st order Res
Ref
1st order Res
Ready
Sample based
Offset=0
T=10.000


Log Signals
Add Viewer
Signal Table
PREPARE
Fast Restart
First_Order_and_Second_Order_Systems
Ref
1
0.4s + 1
1st order Res
1st order system
Scope
Ref, 1st order Res
Ref
1st order Res
Ready
Sample based
Offset=0
T=10.000

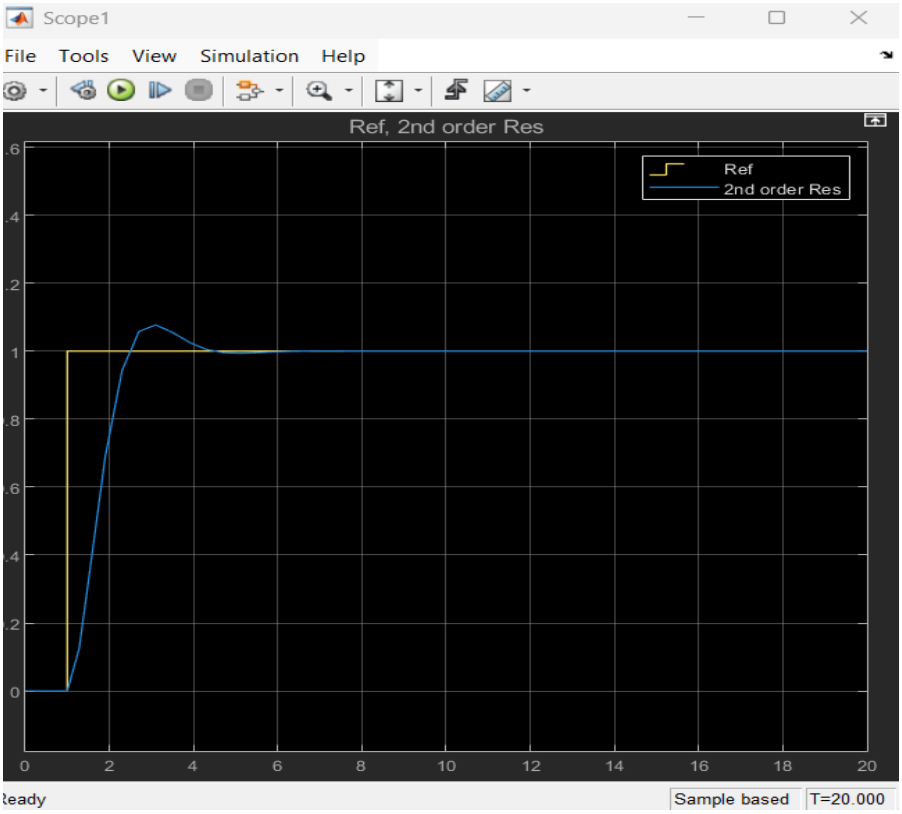
Part 2: Second-Order System



For wn=2 & zeta=0.25.



For wn=2 & zeta=0.63; settling time decreases and the oscillations decrease.



For wn=3.5 & zeta=0.25; fast response.