```
------------------------------<(M File)>------------------------------
clc;
TR=0:0.01:10;
x0=[0;0;0;0;0];
[t,x]=ode45(@Task2Fun,TR,x0);
x1=x(:,1);
x1_dot=x(:,2);
x1_ddot=gradient(x1_dot)./gradient(t);
x2=x(:,3);
x2_dot=x(:,4);
x2_ddot=gradient(x2_dot)./gradient(t);
subplot(2,3,1);
plot(t,x1);xlabel('time');ylabel('x1');
subplot(2,3,2);
plot(t,x1_dot);xlabel('time');ylabel('x1 dot');
subplot(2,3,3);
plot(t,x1_ddot);xlabel('time');ylabel('x1 double dot')
subplot(2,3,4);
plot(t,x2);xlabel('time');ylabel('x2');
subplot(2,3,5);
plot(t,x2_dot);xlabel('time');ylabel('x2 dot');
subplot(2,3,6);
plot(t,x2_ddot);xlabel('time');ylabel('x2 double dot')
%%%%%%%%%%%%%%%%%%%%
function dy=Task2Fun(t,y)
   f=1;
   dy(1)=y(2);
   dy(2)=1/4*(f - 8*y(2) - 5*y(1) + 8*y(4) + 5*y(5));
   dy(3)=y(4);
   dy(5)=1/4*(5*y(1) + 4*y(4) - 5*y(5));
   dy(4)=1/4*(8*y(2) + 4*dy(5) - 16*y(4));
   dy=dy';
end
```

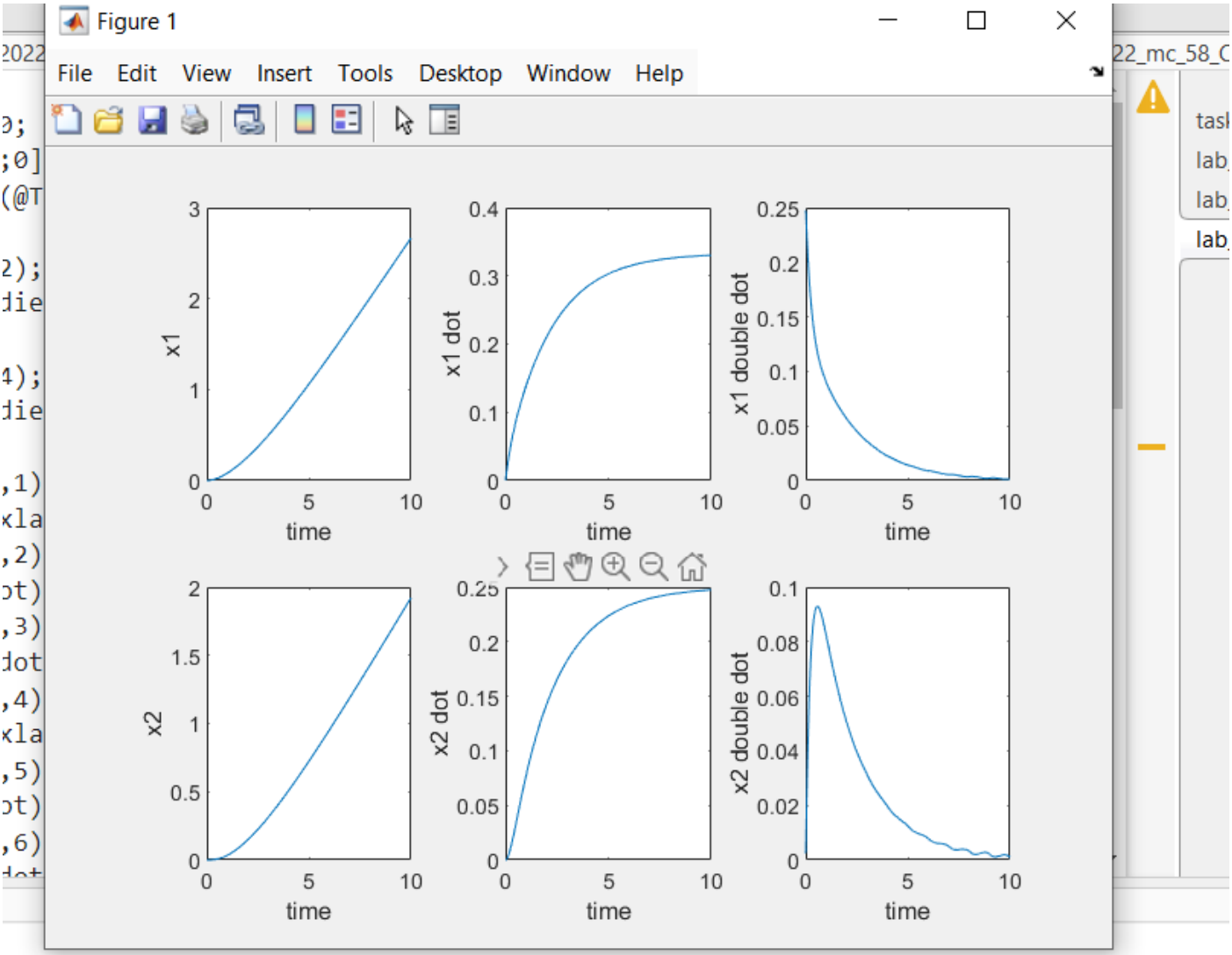
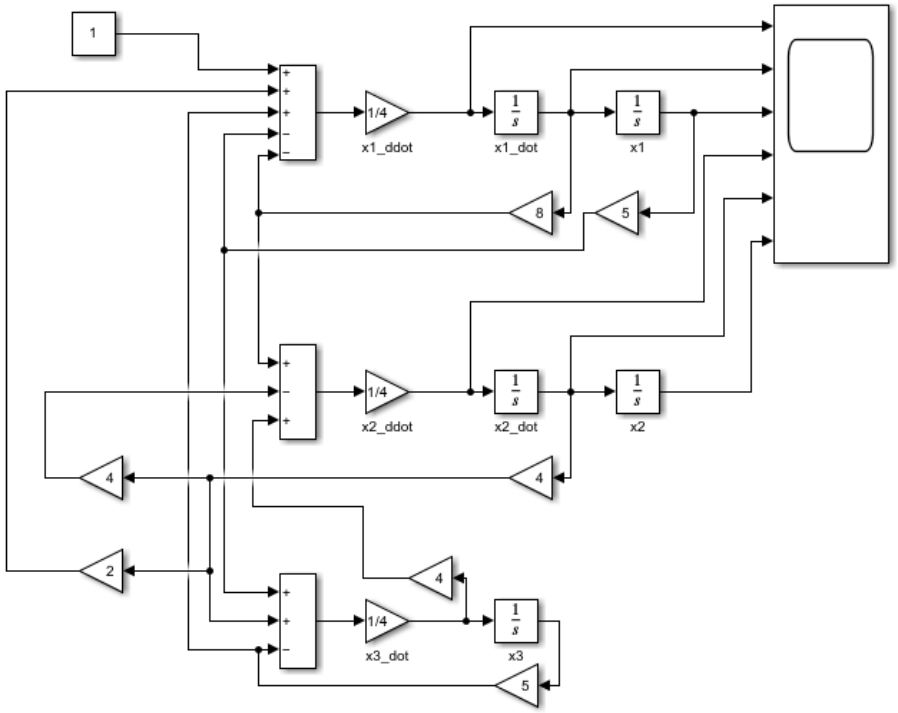
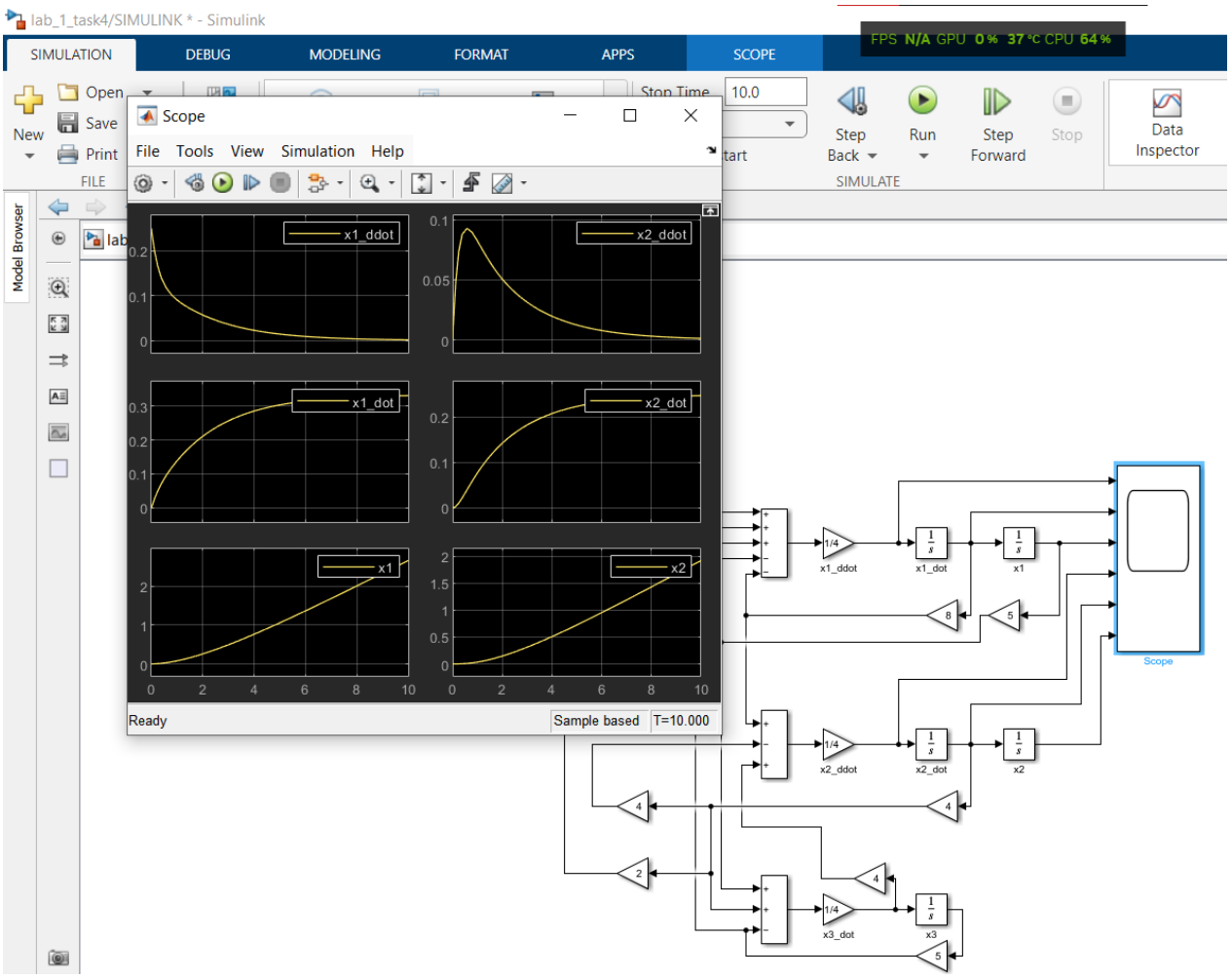


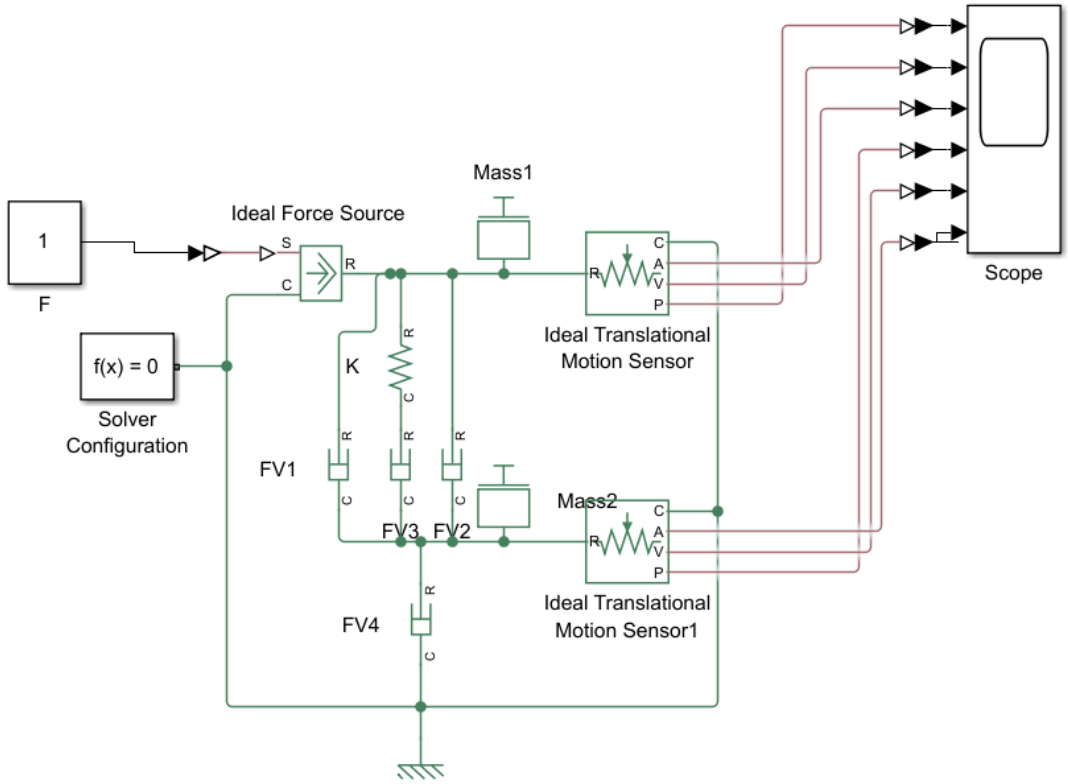
Figure 1
File Edit View Insert Tools Desktop Window Help
x1
x1 dot
x1 double dot
x2
x2 dot
x2 double dot
time

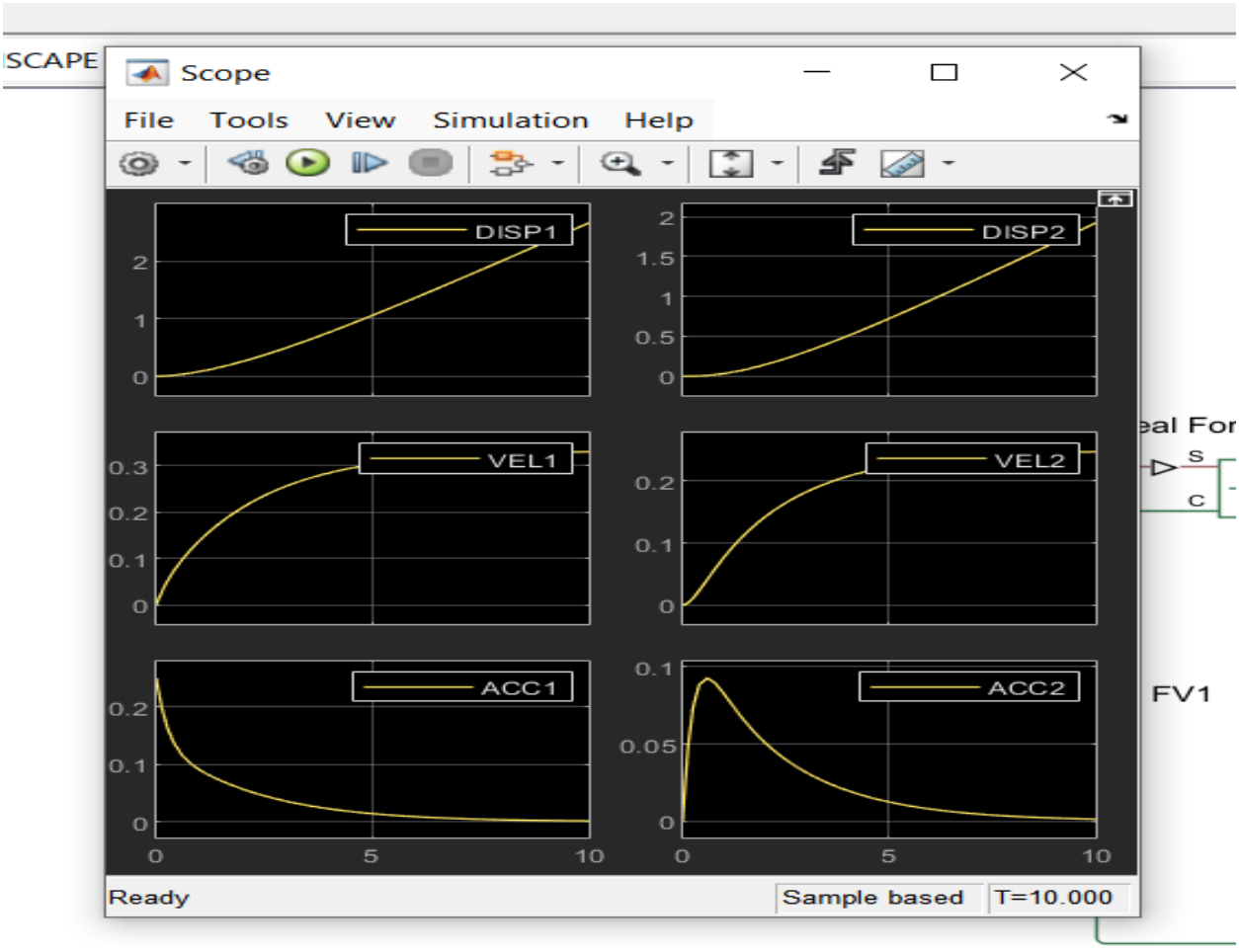
----------<(Simulink)>----------

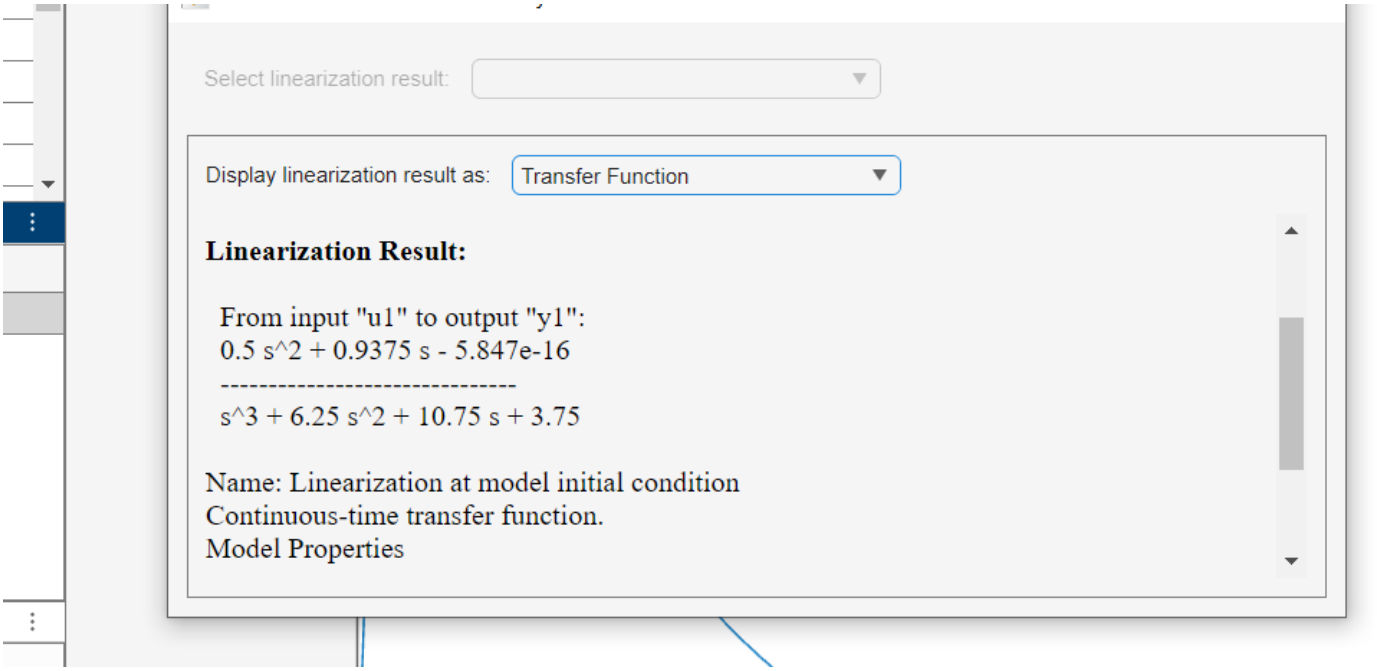

1
1/4
x1_ddot
x1_dot
x1
8
5
1/4
x2_ddot
x2_dot
x2
4
4
2
4
1/4
x3_dot
x3
5


lab_1_task4/SIMULINK * - Simulink
SIMULATION
DEBUG
MODELING
FORMAT
APPS
SCOPE
FPS N/A GPU 0% 37°C CPU 64%
Open
Save
Print
New
FILE
Stop Time
10.0
Step Back
Run
Step Forward
Stop
Data Inspector
SIMULATE
Scope
File Tools View Simulation Help
x1_ddot
x2_ddot
x1_dot
x2_dot
x1
x2
Ready
Sample based
T=10.000
Model Browser
Scope

----------<(SIMSCAPE)>----------


1
F
Ideal Force Source
S
C
R
Mass1
C
A
V
P
Ideal Translational
Motion Sensor
Scope
f(x) = 0
Solver
Configuration
K
FV1
FV3
FV2
Mass2
Ideal Translational
Motion Sensor1
FV4


SCAPE
Scope
File
Tools
View
Simulation
Help
DISP1
DISP2
VEL1
VEL2
ACC1
ACC2
Ready
Sample based
T=10.000
FV1


Select linearization result:
Display linearization result as:
Transfer Function
Linearization Result:
From input "u1" to output "y1":
0.5 s^2 + 0.9375 s - 5.847e-16
---
s^3 + 6.25 s^2 + 10.75 s + 3.75
Name: Linearization at model initial condition
Continuous-time transfer function.
Model Properties