Plotting Function

```
part1 = fileread("slmcnm_part1");
fineplot(linspace(0,10,length(part1)),part1,'Raw Data','t','y(t)',[-1,10],[-10,180],'off',[400 400])

part2_1 = fileread("filtered_data");
fineplot(linspace(0,10,length(part2_1)),part2_1,'Filtered Data','t','y(t)',[-1,10],[-10,180],'off',[400 400])

%gain and tau of first order
disp(fileread("foaprox"))

part2_2 = fileread("bnamcnm_part2_aprox");
fineplot(linspace(0,10,length(part2_2)),part2_2,'Approximated Data','t','y(t)',[-1,10],[-10,180],'off',[400 400])

hold off
plot(linspace(0,10,length(part1)),part1,"LineWidth",1.5)
hold on
plot(linspace(0,10,length(part2_1)),part2_1,"LineWidth",1.5)
fineplot(linspace(0,10,length(part2_2)),part2_2,'Approximated Data','t','y(t)',[-1,10],[-10,180],'off',[400 400])
hold off
legend({'Raw Data','Filtered Data','Approximation'},'Position',[0.6 0.3 0.1 0.1])

part3_1 = fileread("first_PI");
fineplot(linspace(0,10,length(part3_1)),part3_1,'Untuned PI Controller','t','y(t)',[-1,10],[-10,140],'off',[400 400])
grid on

part3_2 = fileread("tuned_datası")
fineplot(linspace(0,10,length(part3_2)),part3_2,'Tuned PI Controller','t','y(t)',[-1,10],[-10,140],'off',[400 400])
grid on

subplot(2,2,[1,3])
t = linspace(0,10,length(part3_2));
fineplot(t(1:round(length(t)*0.06)),part3_2(1:round(length(t)*0.06)),'Rise Time and Rising Curve','t','y(t)',[-0.05,0.6],
[-10,140],'off',[400 400])
grid on
subplot(2,2,2)
fineplot(t(1:round(length(t)*0.06)),part3_2(1:round(length(t)*0.06)),'Rising Corner and Overshoot','t','y(t)',[-0.05,0.6],
[119,121],'off',[400 400])
grid on
subplot(2,2,4)
fineplot(t(1:round(length(t)*0.9)),part3_2(1:round(length(t)*0.9)),'Steady State Error (Zoomed)','t','y(t)',[-1,9],
[119.99,120.01],'off',[400 400])
grid on

clf;
part3_3 = fileread("ki=20kp");
fineplot(linspace(0,10,length(part3_3)),part3_3,'K_i = 20K_p PI Controller','t','y(t)',[-1,10],[-10,160],'off',[400 400])

part3_4 = fileread("kp=10ki_datası");
fineplot(linspace(0,10,length(part3_4)),part3_4,'K_p = 10K_i PI Controller','t','y(t)',[-1,10],[-10,160],'off',[400 400])
grid on

part4 = fileread("part4")
plot(linspace(0,10,length(part4)),part4)
grid on
hold on
fineplot(linspace(0,10,length(part3_2)),part3_2,'Tuned PI Controller Overlaid','t','y(t)',[-1,10],[-10,140],'off',[400 400])
legend({'Raw Data of PI Controller','Simulation of PI Controller'},'Position',[0.6 0.3 0.1 0.1])

part4_2 = fileread("filtered_PI");
plot(linspace(0,10,length(part4)),part4)
hold on
plot(linspace(0,10,length(part4_2)),part4_2)
fineplot(linspace(0,10,length(part3_2)),part3_2,'Filtered Tuned and Simulated PI Controller Overlaid','t','y(t)',[-1,10],
[-10,140],'off',[400 400])
legend({'Raw Data of PI Controller','Filtered Data of PI Controller','Simulation of PI Controller'},'Position',[0.6 0.3 0.1
0.1])
```

```
subplot(2,2,[1,3])
t4_2 = linspace(0,10,length(part4_2));
fineplot(t4_2(1:round(length(t4_2)*0.06)),part4_2(1:round(length(t4_2)*0.06)),'Rise Time and Rising Curve','t','y(t)',
[-0.05,0.6],[-10,140],'off',[400 400])
grid on
subplot(2,2,2)
fineplot(t4_2(1:round(length(t4_2)*0.06)),part4_2(1:round(length(t4_2)*0.06)),'Rising Corner and Overshoot','t','y(t)',
[-0.05,0.6],[117,123],'off',[400 400])
grid on
subplot(2,2,4)
fineplot(t4_2(1:round(length(t4_2)*0.9)),part4_2(1:round(length(t4_2)*0.9)),'Steady State Error (Zoomed)','t','y(t)',[-1,9],
[117,123],'off',[400 400])
grid on

function xread = fileread(name)
    filename = append(name,'.txt');
    % open your file for reading
    file1 = fopen(filename,'r');
    % write the matrix
    xread = fscanf(file1,'%f\n');
    % close the file
    fclose(file1);
end
```