```matlab
clear

filename = 'graph.txt';
delimiter = ' ';
headerLinesIn = 0;
A = importdata(filename, delimiter, headerLinesIn);

% 1950 is included in the pre 1950
avPre1950 = mean(A(1:70, 2));
uncertPre1950 = std(A(1:70, 2));
errorPre1950 = uncertPre1950 / (sqrt(70-1));

avPost1950 = mean(A(71:143, 2));
uncertPost1950 = std(A(71:143, 2));
errorPost1950 = uncertPost1950 / (sqrt(143-72));

% Difference in Means and its Uncertainty
diffInMean = abs(avPre1950 - avPost1950);
errorDiff = sqrt(errorPre1950^2 + errorPost1950^2);

% Confidence Interval
c = 1.96;
n = 143;
k = c * errorDiff * n^(-1/2);

upperBound = diffInMean + k;
lowerBound = diffInMean - k;

% Estimate Probability
stdAway = diffInMean / errorDiff;

% How fast Earth's Temp is Rising
x = A(96:end, 1);
y = A(96:end, 2);
% Found number below by getting rchi2 close to 1
dy = ones(size(y)) * 0.09426;
[a,da,sig_a,rchi2]=weightedPoly(1,x,y,dy);

slope = a(2);
uncertSlope = da(2);

% Plot recent warming trend

figure
errorbar(x,y,dy,'o')
hold on
plot(x, y, '.')
plot(x, a(1) + a(2)*x)
title('Recent Warming Trend')
xlabel('Year')
ylabel('Temperature Mean')
hold off
```

```matlab
% Fit the Full Dataset
x = A(:, 1);
y = A(:, 2);

% The first 3 degrees
degree = 0;
dy = ones(size(y)) * 0.36;
[p0,d_p0,sig_p0,rchi2_p0]=weightedPoly(degree,x,y,dy);

figure
subplot(3,1,1)
plot(x, y, '.')
hold on
errorbar(x,y,dy,'o','Color','#549C67');
yline(p0(1),'Color','#A2142F')
hold off
title('Degree 0')
xlabel('Year')
ylabel('Temperature Mean')


degree = 1;
dy = ones(size(y)) * 0.175;
[p1,d_p1,sig_p1,rchi2_p1]=weightedPoly(degree,x,y,dy);

subplot(3,1,2)
plot(x, y, 'o')
hold on
errorbar(x,y,dy,'o','Color','#549C67');
plot(x, p1(1) + p1(2).*x,'Color','#A2142F')
hold off
title('Degree 1')
xlabel('Year')
ylabel('Temperature Mean')

degree = 2;
dy = ones(size(y)) * 0.115;
[p2,d_p2,sig_p2,rchi2_p2]=weightedPoly(degree,x,y,dy);

subplot(3,1,3)
plot(x, y, 'o')
hold on
errorbar(x,y,dy,'o','Color','#549C67');
plot(x, p2(1) + p2(2).*x + p2(3).*x.*x,'Color','#A2142F')
hold off
title('Degree 2')
xlabel('Year')
ylabel('Temperature Mean')


%The second 3 degrees
% The warnings come from the degree being too high
```

```matlab
degree = 3;
dy = ones(size(y)) * 0.115;
[p3,d_p3,sig_p3,rchi2_p3]=weightedPoly(degree,x,y,dy);

figure
subplot(2,1,1)
plot(x, y, 'o')
hold on
errorbar(x,y,dy,'o','Color','#549C67');
plot(x, p3(1) + p3(2).*x + p3(3).*x.*x + p3(4).*x.*x.*x,'Color','#A2142F')
hold off
title('Degree 3')
xlabel('Year')
ylabel('Temperature Mean')


degree = 4;
dy = ones(size(y)) * 0.1207;
[p4,d_p4,sig_p4,rchi2_p4]=weightedPoly(degree,x,y,dy);

subplot(2,1,2)
plot(x, y, 'o')
hold on
errorbar(x,y,dy,'o','Color','#549C67');
plot(x, p4(1) + p4(2).*x + p4(3).*x.*x + p4(4).*x.*x.*x +
 p4(5).*x.*x.*x.*x,'Color','#A2142F')
hold off
title('Degree 4')
xlabel('Year')
ylabel('Temperature Mean')

Warning: Matrix is close to singular or badly scaled. Results may be
 inaccurate.
RCOND =  1.102320e-20.
Warning: Matrix is close to singular or badly scaled. Results may be
 inaccurate.
RCOND =  9.958979e-31.
Warning: Matrix is close to singular or badly scaled. Results may be
 inaccurate.
RCOND =  5.007246e-41.
```
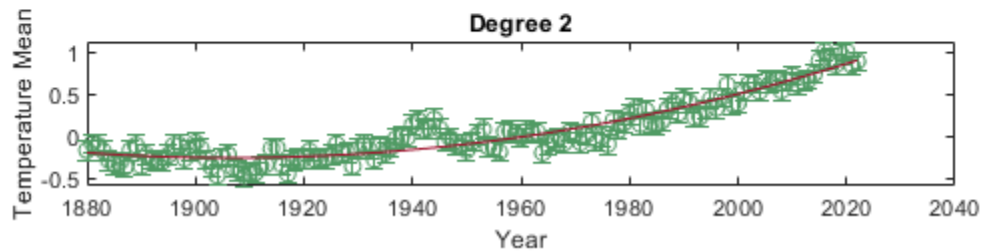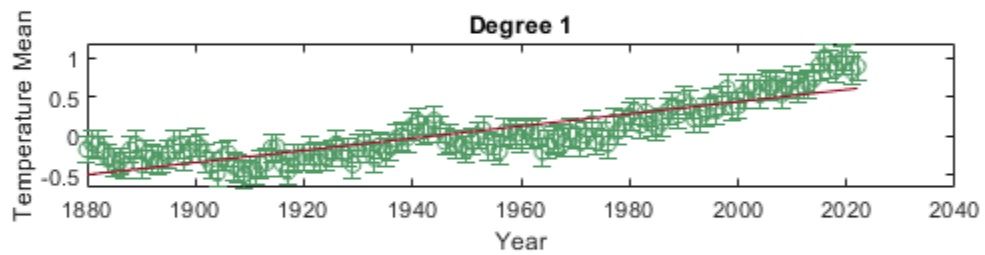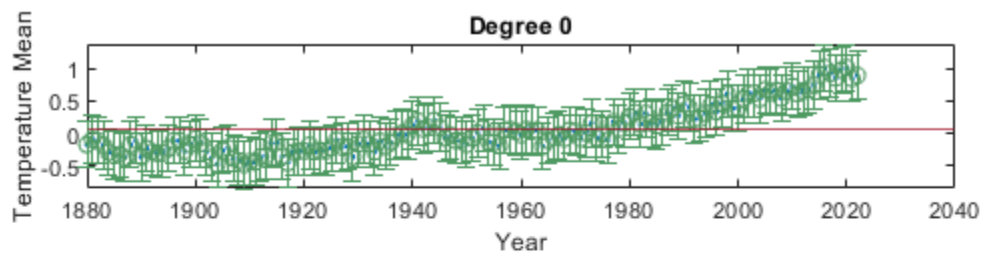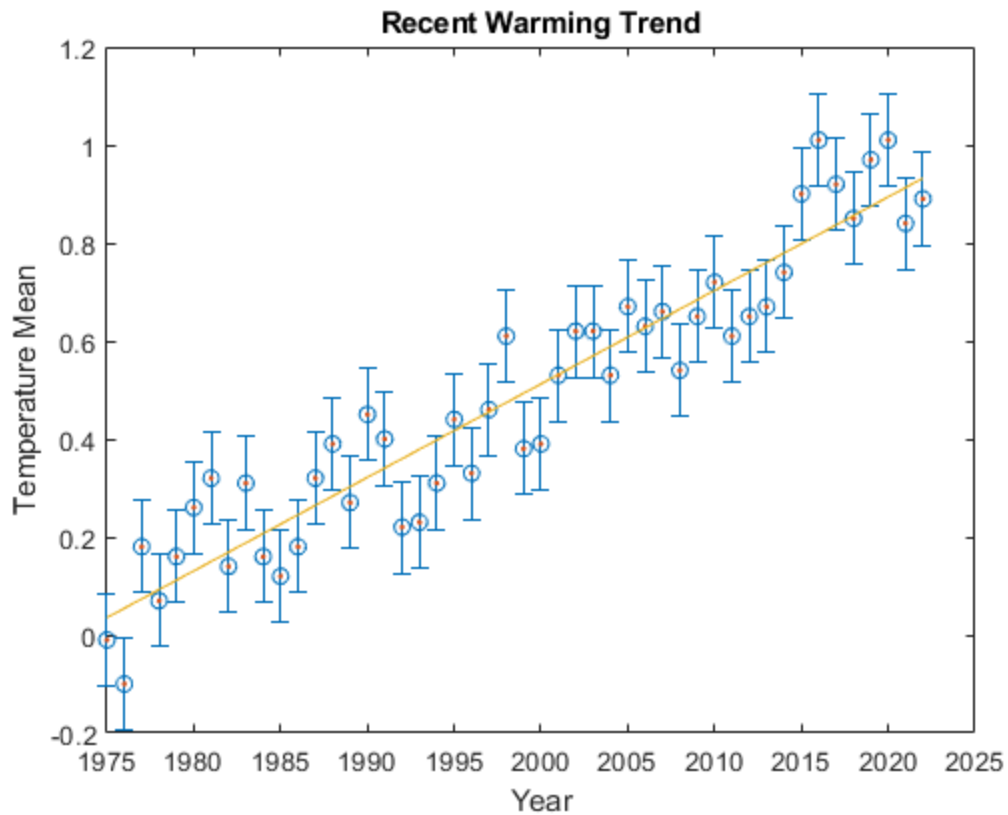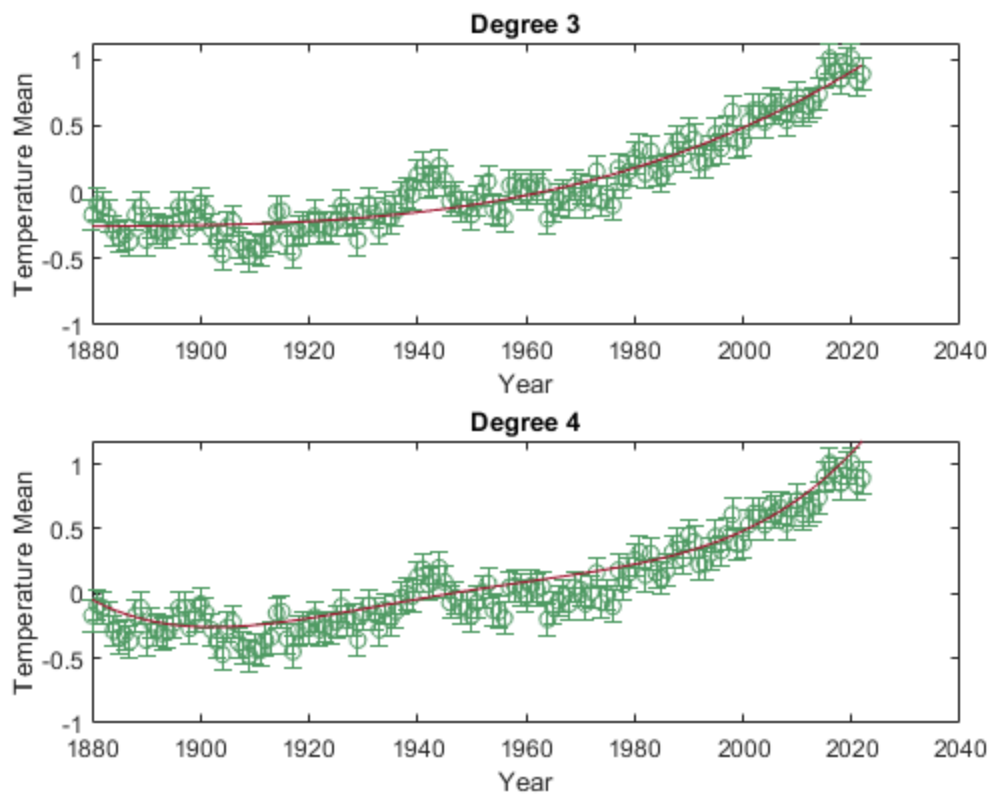
Recent Warming Trend

Degree 0

Degree 1

Degree 2

Degree 3

Degree 4

Published with MATLAB® R2022b