Topic: Linear regression, polynomial regression, General Least-squares fit
Read:. Intro to Part 4; Chapter 14, sections 14.3.2; pg 365 & fig 14.12; 14.5.2. Ch 15: 15.2, example 15.4
Download `rsquaredF.m` and use as instructed.
Create a plot for every problem unless otherwise instructed. All plots should include data points (use a marker) and curve fit (use a solid line; with different colors & legend when more than one curve fit). Label and title all plots!

Handwork problem:

HW8_1

Apply least squares fitting to derive the normal equations and solve for the coefficients by hand (using Cramer's rule) for the model $y = a_1 x + a_2 x^2$. Use the data below to evaluate the values of the coefficients.

v, (m/s)	10	20	30	40	50	60	70	80
F, (N)	25	70	380	550	610	1220	830	1450

Coding problems:

HW8_2 Fit the data in the table using linear regression. Plot the data points as well as the regression line. Use `rsquaredF` to compute r^2 and place it on the plot using the `text` command.
Determine the value of y when x = 7.2 and print it to the screen using `fprintf`.
Hint: Use `polyfit`

x	1	2	3	4	5	6	7	8	9	10
y	26.7	20.2	16.8	15.3	15.1	9.3	5.1	2.8	–1.1	–8.4

HW8_3 Fit the recorded daily temperatures in Lubbock, TX on June 16, 2016 to the following periodic model

a) $y = c_1 + c_2 \cos\left(\frac{\pi t}{12}\right) + c_3 \sin\left(\frac{\pi t}{12}\right)$

b) $y = c_1 + c_2 \cos\left(\frac{\pi t}{12}\right) + c_3 \sin\left(\frac{\pi t}{12}\right) + c_4 \cos\left(\frac{\pi t}{6}\right)$

Plot each of the curves on a separate graph. Include the data points and place the equation (with correct coefficients) in the title. Use `rsquaredF` to compute r^2 for each model and display the result on screen using `fprintf`.

Time of day	12 mid	2 am	4 am	6 am	8 am	10 am	Noon	2 pm	4pm	6pm	8pm	10pm	12 mid
t	0	2	4	6	8	10	12	14	16	18	20	22	24
Temp (F)	71.1	69.1	66.0	69.1	73.0	79.0	86.0	93.0	96.1	93.9	91.0	82.9	82.0

Hint: Use backslash on the overdetermined system.