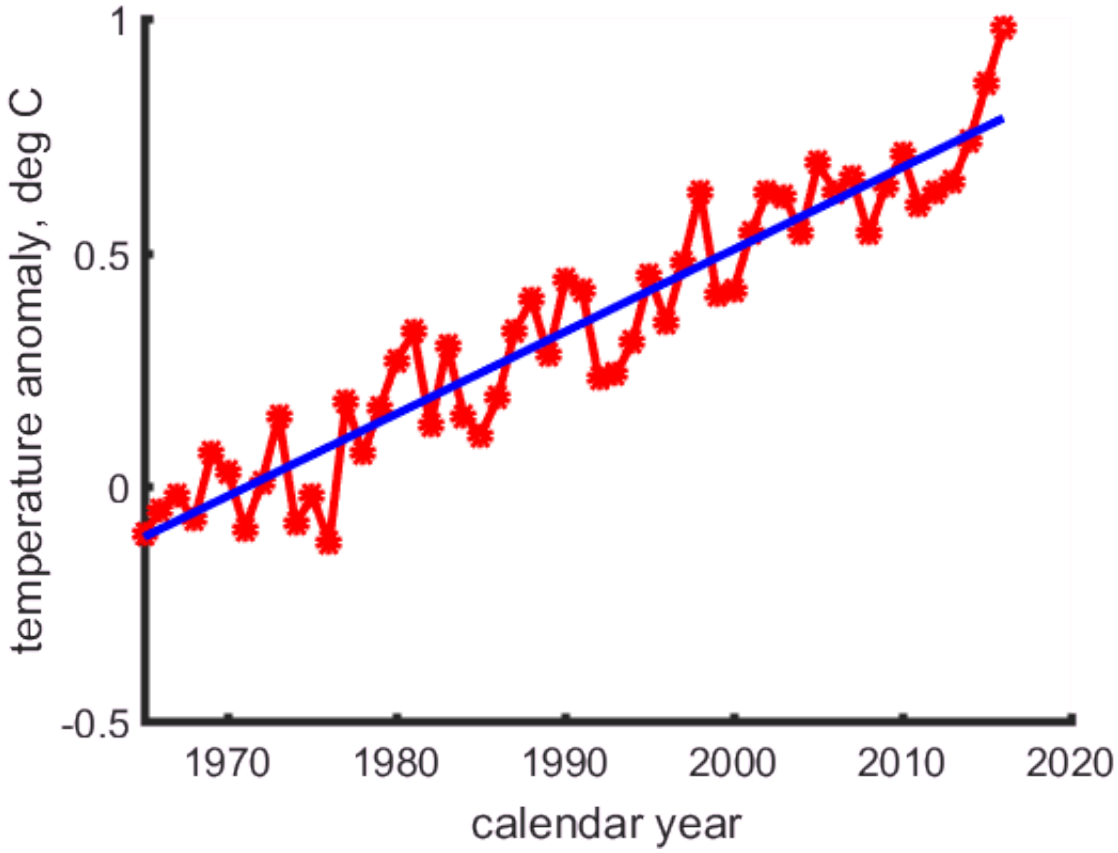
```
clear all;

% gda01_01
%
% straight line fit to 1965-2016 global temperature data
% supports Figure 1.1

% Hansen, J., Mki. Sato, R. Ruedy, K. Lo, D.W. Lea, and M. Medina-Elizade,
% 2006: Global temperature change. Proc. Natl. Acad. Sci., 103, 14288-14293,
% doi:10.1073/pnas.0606291103.

% load data from text file
D=load('../data/global_temp.txt');
t=D(:,1);
d=D(:,2);
N=length(d);

% plot data
figure(1);
clf;
set(gca,'LineWidth',3);
set(gca,'FontSize',14);
hold on;
axis( [1965, 2020, -0.5, 1.0] );
plot(t,d,'r-','LineWidth',3);
plot(t,d,'ro','LineWidth',3);
xlabel('calendar year');
ylabel('temperature anomaly, deg C');

% set up data kernel
M=2;
G=zeros(N,M);
G(:,1)=1;
G(:,2)=t;

% least squares solution and predicted data
mest = (G'*G)\(G'*d);
dpre = G*mest;

% plot straight line fit
plot(t,dpre,'b-','LineWidth',3);
```




```
% Figure 1.1 (Red) Average global temperature for the time period, 1965–2010. The inverse prob
% is to determine the rate of increase of temperature and its confidence interval. (Blue) Stra
% line fit to data. The slope of the line is 0.015 ± 0.002 (95%) °C/year. Data from Hansen et
% 2010. MatLab script gda01_01.

% variance calculation
e = (d - dpre);
E = e'*e;
s2d = E/N;
C = s2d * inv(G'*G);
sm = sqrt(C(2,2));

% display slope
disp(sprintf('slope: %f +/- %f deg/yr', mest(2), 2*sm));
```

```
slope: 0.017534 +/- 0.001677 deg/yr
```