

# Multilinear Regression - Example 1

```
clc
clear
close all
```

## Source

[Linear Regression 2 \[Matlab\]](#)

## Portland Cement Data

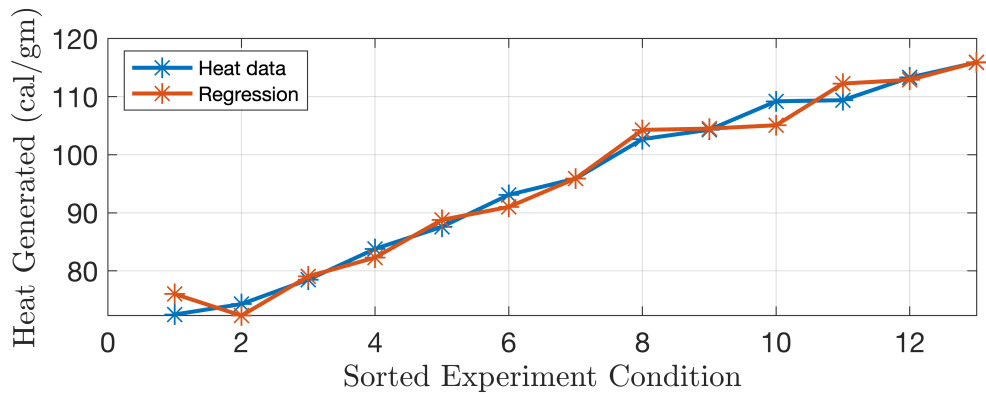
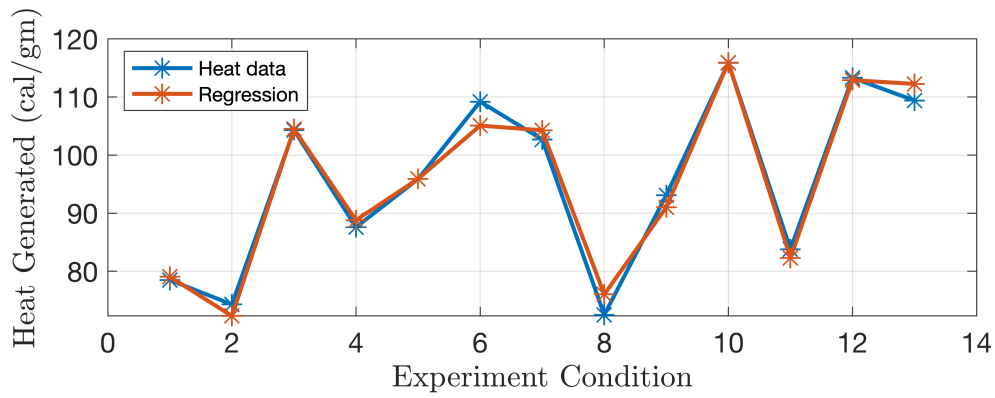
```
load hald.mat           % load Portland Cement dataset
A = ingredients;       % 13x4 matrix - 13 mixtures; 4 ingredients
b = heat;              % heat data (cal/gm)

[U,S,V] = svd(A,'econ');
xtilde = V*inv(S)*U'*b; % solve Ax=b using the SVD

subplot(2,1,1)
plot(b,'-*','LineWidth',2,'MarkerSize',10) % plot data
hold on
plot(A*xtilde,'-*','LineWidth',2,'MarkerSize',10) % plot regression
hold off
grid on
set(gca,'FontSize',14)
xlabel('Experiment Condition','Interpreter','latex')
ylabel('Heat Generated (cal/gm)','Interpreter','latex')
l1 = legend('Heat data','Regression');
set(l1,'FontSize',10,'Location','northwest')

[b sortind] = sort(heat(:,size(heat,2))); % sorted values

subplot(2,1,2)
plot(b,'-*','LineWidth',2,'MarkerSize',10)
grid on
hold on
plot(A(sortind,:)*xtilde,'-*','LineWidth',2,'MarkerSize',10)
hold off
xlabel('Sorted Experiment Condition','Interpreter','latex')
xlim([0 size(A,1)])
ylabel('Heat Generated (cal/gm)','Interpreter','latex')
l1 = legend('Heat data','Regression');
set(l1,'FontSize',10,'Location','northwest')
set(gca,'FontSize',14)
```



```

% Alternative 1
xtilde = regress(b,A);

% Alternative 2
xtilde = pinv(A)*b;

```