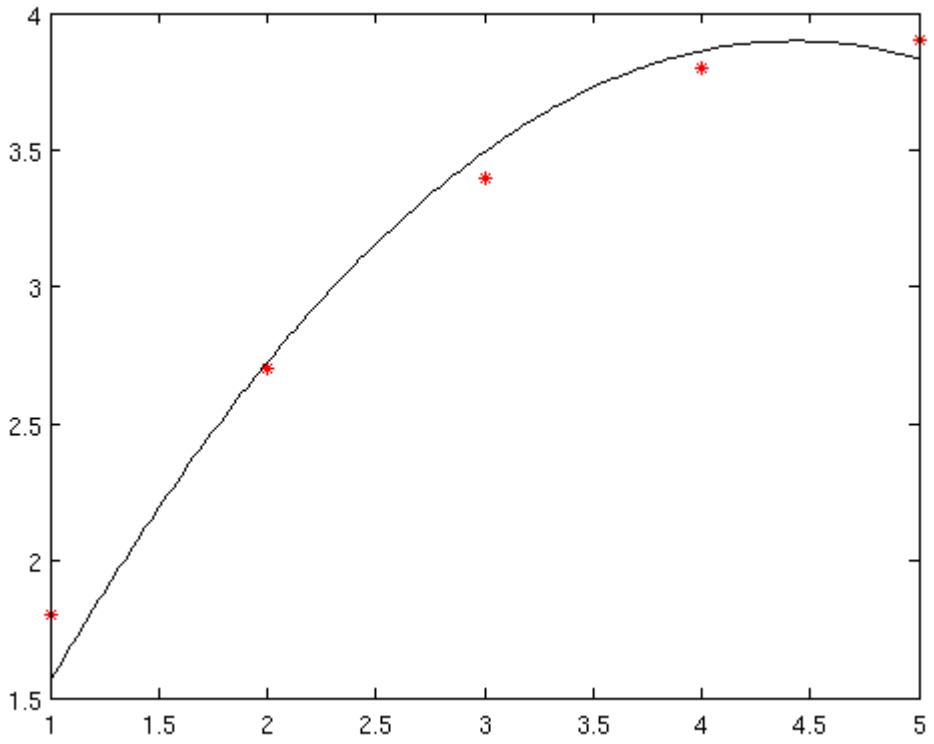
Contents

Solutions to HW replacing 7.1

Exercise 7, 6.6:

```
% The design matrix is the matrix A from the system of equations.
% case,
x=[1;2;3;4;5];
y=[1.8;2.7;3.4;3.8;3.9];

A=[x x.^2];
%Solve for the unknown by solving the normal equations:
c=inv(A'*A)*A'*y;
%  Not necessary, but we'll include a plot below.  For the plot, w
%  more x's than the integers-  We'll call it t:
t=linspace(1,5,200);  %200 evenly spaced points between 1 and 5
ymodel=c(1)*t+c(2)*t.^2;
plot(x,y,'r*',t,ymodel,'k-');
```

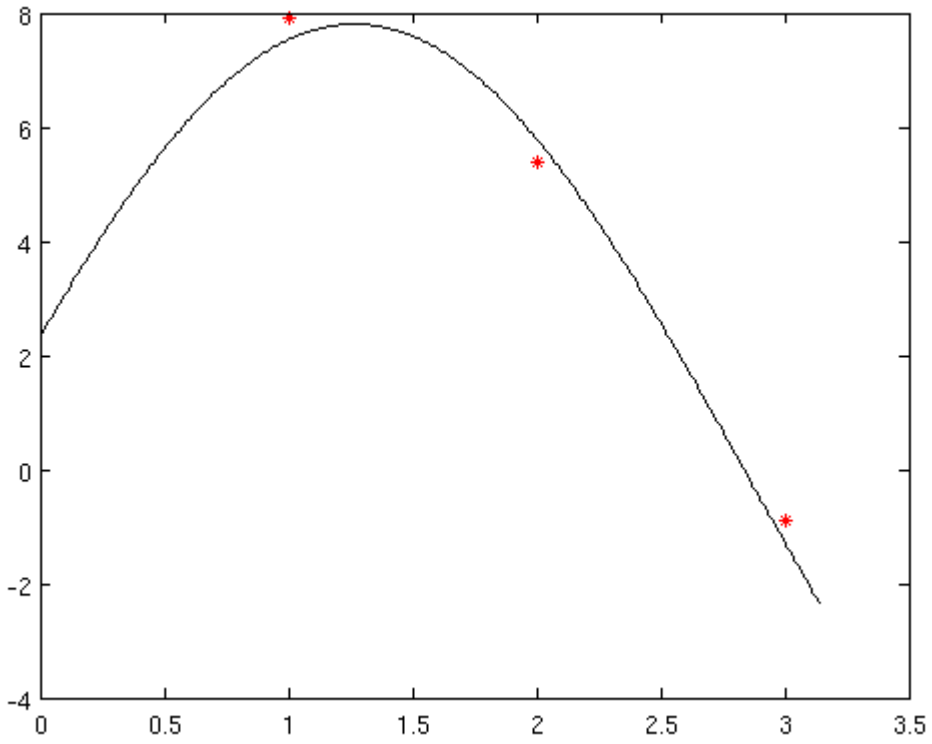


Exercise 9, Section 6.6:

Same idea as Exercise 7. The design matrix is from the system of equations:

```
clear; %clears out the old variables from the previous problem
x=[1;2;3];
y=[7.9;5.4;-0.9];

A=[cos(x) sin(x)];
%Solve again by the normal equations:
c=inv(A'*A)*A'*y;
% Another plot to visualize what we just did:
t=linspace(0,pi,300);
ymodel=c(1)*cos(t)+c(2)*sin(t);
plot(x,y,'r*',t,ymodel,'k-');
```



Exercise 12, Section 6.6:

Pretty much the same set of Matlab commands are used here:

```
clear; %clears out the old variables from the previous problem
n=5;   %This is the number of points
w=[44;61;81;113;131];
p=[91;98;103;110;112]

A=[ones(n,1) log(w)];
%Solve again by the normal equations:
c=inv(A'*A)*A'*p;

% Evaluate the model at w=100.  The following line just prints to
fprintf('The model blood pressure for 100 pounds is:\n');
c(1)+c(2)*log(100)

% Another plot to visualize what we just did:
t=linspace(44,131,300);
ymodel=c(1)+c(2)*log(t);
plot(log(w),p,'r*',log(t),ymodel,'k-');
```

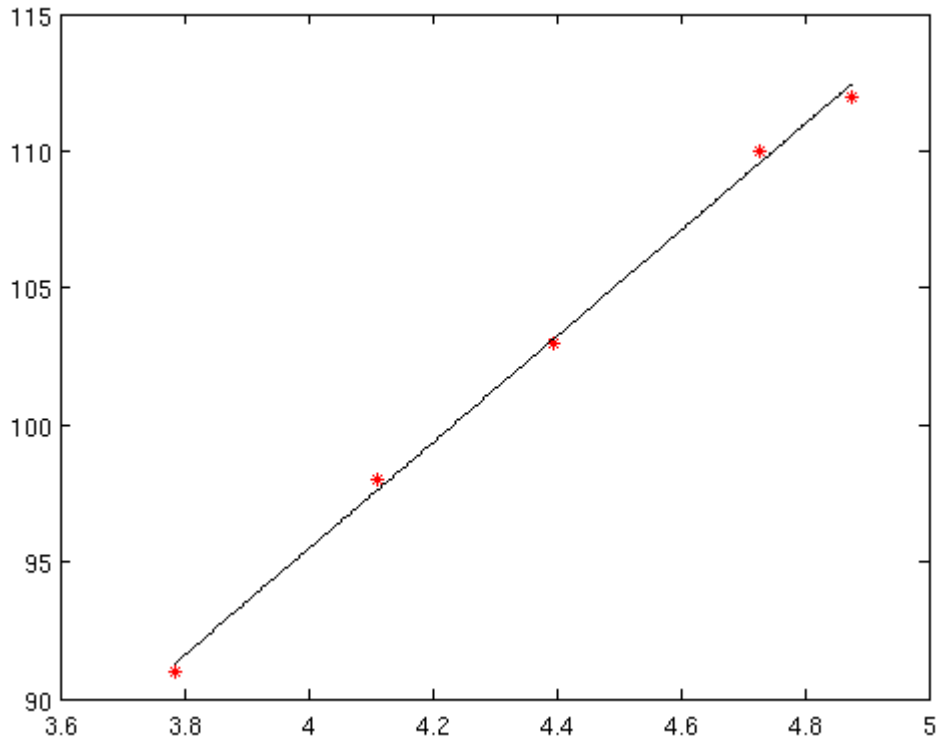
```
p =

    91
    98
   103
   110
   112

The model blood pressure for 100 pounds is:

ans =

  107.1956
```



Exercise added (#6 on the sheet, handwritten)

```
clear
x=[-3;-1.8;-0.6;0.6;1.8;3];
```

```
y=[-1;-0.6;-0.2;0.2;0.6;1];
z=[7;1.88;-0.6;-0.7;1.9;7];

A=[x.^2 y.^2 x y ones(6,1)];
%Solve for the unknown by solving the normal equations:
%c=inv(A'*A)*A'*z;

% Whoops- My mistake; Matrix A only has rank 3 (do an rref of A to
% which columns are basic!)
```