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## Table of Contents

Problem 1 .....	1
Problem 2 .....	1
Problem 3 .....	1
Problem 4 .....	1
Problem 5 .....	1
Problem 6 .....	2
Problem 7 .....	2

## Problem 1

```
type quadfit % prints out code for function quadfit

function [N, XT, D, YT, beta_est, Y_est] = quadfit(X, Y)
N = length(X);
XT = X';
D = [ones(N,1), XT, XT.^2];
YT = Y';
beta_est = (D'*D)^-1*(D'*YT);
Y_est = D*beta_est;
end
```

## Problem 2

```
load 'pts_setA(1).mat'
X = ptsMixA(1,:); % setting X
Y = ptsMixA(2,:); % setting Y
```

## Problem 3

```
[N, XT, D, YT, beta_est, Y_est] = quadfit(X, Y); % running quadfit
```

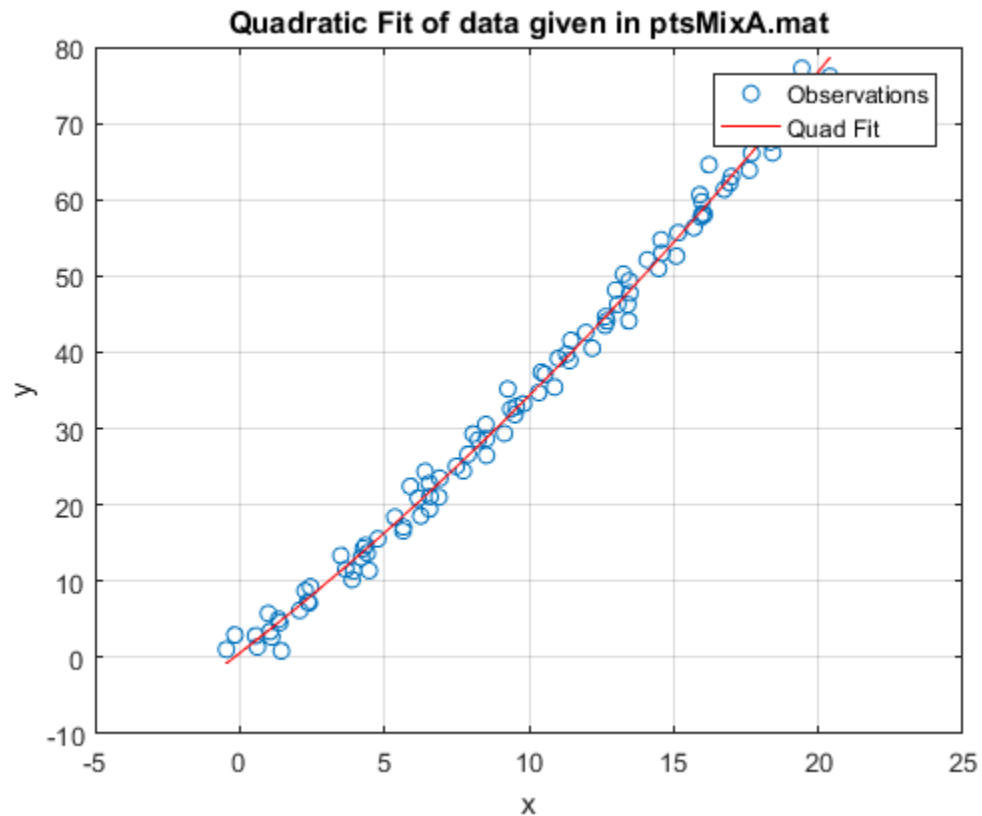
## Problem 4

```
%{
Calculated in quadfit printed above
%}
```

## Problem 5

```
plot(X, Y, 'o'), hold on, grid on % plotting data points of
pts_setA(1)
```

```
plot(X, Y_est, 'r') % plotting line of best fit
legend('Observations','Quad Fit') % labeling legend
xlabel('x')
ylabel('y')
title('Quadratic Fit of data given in ptsMixA.mat') % labeling title
```



## Problem 6

```
err = YT - Y_est; % calculating error of each Y value
RMSEQ = (err'*err/N)^0.5 % calculating RMS error
```

*RMSEQ* =

*1.7071*

## Problem 7

```
[N, XT, D, YT, beta_est, Y_est] = linefit(X, Y); % running linefit
err = YT - Y_est; % calculating error of each Y value
RMSEL = (err'*err/N)^0.5 % calculating RMS error
%{
Quadratic fit is better than linear estimate. The RMS error of the
quadrtic
```

```
fit (RMSEQ) is less than that of the linear estimate (RMSEL). This  
    indicates  
that the quadratic fit is better in reference with the data.  
%}
```

*RMSEL* =

*2.1784*

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