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Stat401

Project 6

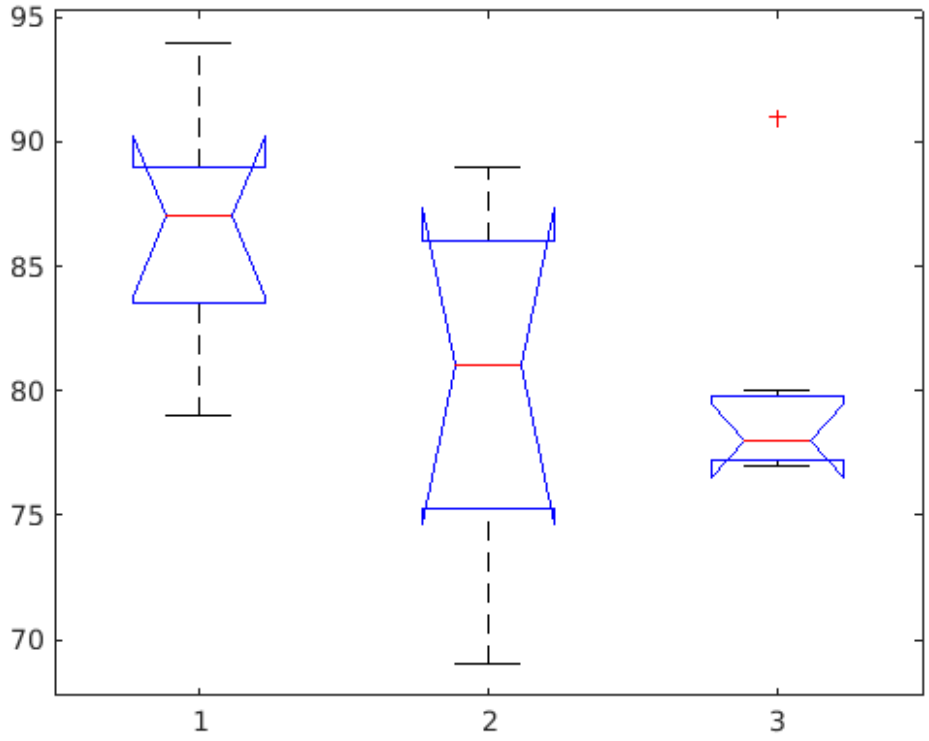
Problem 1

```
data = [79 74 80 ; 87 81 91 ; 85 86 77 ; 94 86 78 ; 89 89 79 ; 89 69
 77 ; 83 79 78];
[p,tbl,stats] = anova1(data);
% A)
tbl

% B)
% x_bar1 = average whiteness rating of sample of cloth washed with
 detergent 1
% x_bar2 = average whiteness rating of sample of cloth washed with
 detergent 2
% x_bar3 = average whiteness rating of sample of cloth washed with
 detergent 3
% Ho: x_bar1 = x_bar2 = x_bar3
% Ha: At least one pair of means is different from each other

% C)
% F= MST/MSE
F = 92.7619/33.1905
% F = 2.79

% D)
p
% P = .0877 so not enough evidence to reject the null at .05
 confidence
% level. The average whiteness of cloths washed by the 3 detergents in
 the
% samples does not differ.
```

```
tbl =

  4×6 cell array

  Columns 1 through 5

    {'Source' }    {'SS'      }    {'df'}    {'MS'      }    {'F'
   }
    {'Columns'}    {[185.5238]}    {[ 2]}    {[ 92.7619]}    {[
 2.7948]}
    {'Error'  }    {[597.4286]}    {[18]}    {[ 33.1905]}    {0×0
double}
    {'Total'  }    {[782.9524]}    {[20]}    {0×0 double}    {0×0
double}

  Column 6

    {'Prob>F'  }
    {[  0.0877]}
    {0×0 double}
    {0×0 double}


F =

    2.7948


p =

    0.0877
```

ANOVA Table

Source	SS	df	MS	F	Prob>F
Columns	185.524	2	92.7619	2.79	0.0877
Error	597.429	18	33.1905		
Total	782.952	20			



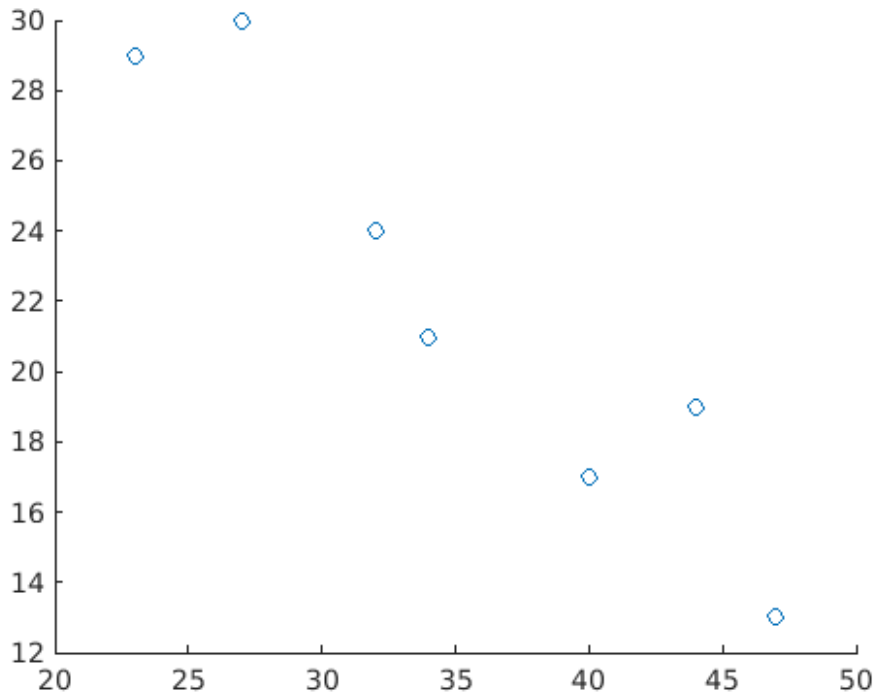
Problem 2

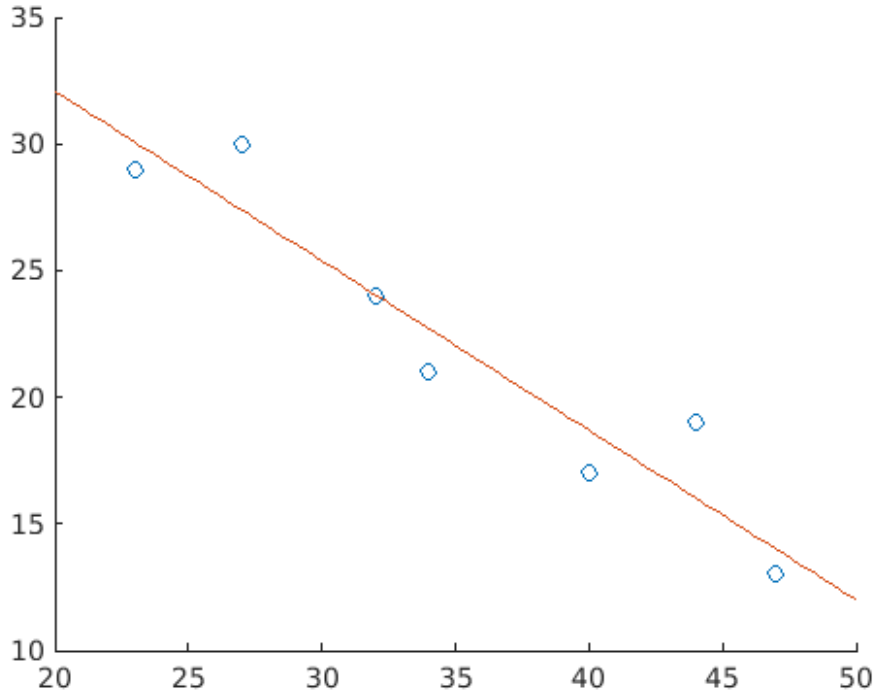
A)

```
figure
x = [27 44 32 47 23 40 34];
y = [30 19 24 13 29 17 21];
scatter(x,y)

% B)
figure
ls = polyfit(x,y,1);
x1 = linspace(20,50);
y1 = polyval(ls,x1);
scatter(x,y);
hold on
plot(x1,y1);
hold off

% C)
% The correlation looks to be strong and negative, since the
% points are fairly close to the regression line, and the slope
% of the regression line is negative.

% D)
lm = fitlm(x,y)
```

```
% R^2 = .898. The percentage of variation
% in y that can be unexplained by the corresponding variation in x
% and the least-squares line is 1-.898
1-.898
% = .1020

% E)
% Y = -0.66901(x) + 45.464

% F)
% for x = 38
% Y =
38*(-.66901)+45.464
%20.0416

% G)
% for 1 unit increase in weight of car, y changes by -0.66901
 mpgpublish('Project6_EyadKamil.m','pdf')
```

```
lm =


Linear regression model:
    y ~ 1 + x1

Estimated Coefficients:
                   Estimate      SE        tStat       pValue
                   ________    _______    _______    __________

    (Intercept)      45.464     3.6433     12.479    5.8621e-05
    x1             -0.66901    0.10059    -6.6508      0.001159


Number of observations: 7, Error degrees of freedom: 5
Root Mean Squared Error: 2.17
R-squared: 0.898,  Adjusted R-Squared: 0.878
F-statistic vs. constant model: 44.2, p-value = 0.00116

ans =

    0.1020


ans =

   20.0416
```





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