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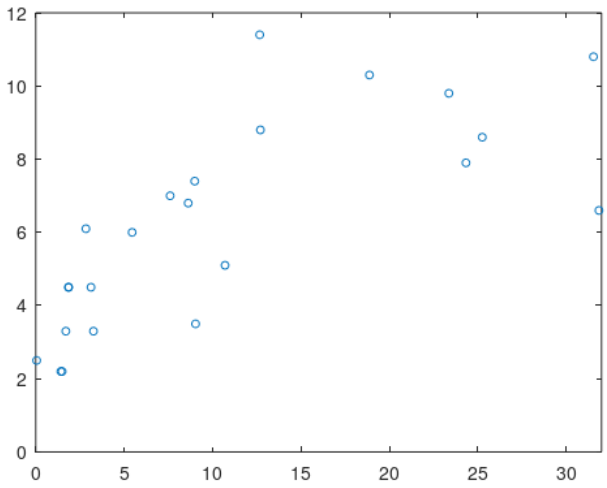
B9TB1710

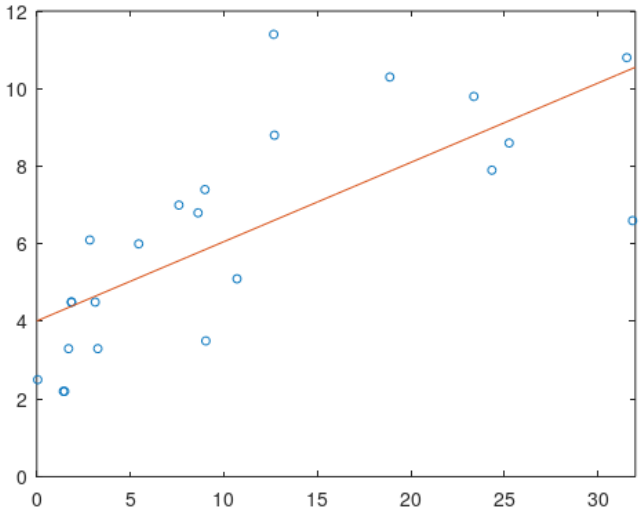
First, I load the file “Nobel_vs_choco.txt” to import the data. By adding to the function **load** command **.data** I can change the data structure into two matrices of size 23×1: matrix “nobel” which contains information about number of Nobel prize laureates in a given country, and “choc” which has information about consumption of chocolate per capita in kg/y/head. I plot this data. The graph is shown below.



CAPS_05_B9TB1710_assn4(1).m | CAPS_05_B9TB1710_assn4(2).m

```
1  #loading data from Nobel_vs_choco.txt as a matrix
2  nobel=load("Nobel_vs_choco.txt").data(:,1)
3  choc=load("Nobel_vs_choco.txt").data(:,2)
4
5  #plotting the data
6  plot(nobel,choc,"o")
7  axis([0,32,0,12])
8  set(gca,"fontsize",14)
9
10 #approximation with Least square method
11 X=ones(23,2);
12 X(:,1)=nobel;
13 P1=pinv(X)*choc;
14 hold on
15 xx=0:1:32;
16 plot(xx,P1(1)*xx+P1(2))
17
```

Next, I want to find line of best fit $y = ax + b$ to my data. In order to find a and b, I use Least square method. I create a matrix X with its column 1 being the Nobel laureates data, and column 2 being all ones. With pseudoinverse of matrix X, I calculate matrix $P1 = \begin{pmatrix} a \\ b \end{pmatrix}$. I use command **hold on** in order to have the line on the same graph as my data. I plot the line as one the right.



In a separate file, I add the data of imaginary kingdom CAPS to “nobel” and “choc” matrices.

CAPS_05_B9TB1710_assn4(1).m | CAPS_05_B9TB1710_assn4(2).m

```
#loading data from Nobel_vs_choco.txt as a matrix
nobel=load("Nobel_vs_choco.txt").data(:,1)
choc=load("Nobel_vs_choco.txt").data(:,2)

#adding imaginary kingdom CAPS
A=1;
B=7;
C=1;
D=0;

nobel(24)=10*(A+B);
choc(24)=0.5*(C+D);

#plotting the data
plot(nobel,choc,"o")
axis([0,82,0,12])
set(gca,"fontsize",14)

#approximation with Least square method
Y=ones(24,2);
Y(:,1)=nobel;
P2=pinv(Y)*choc;
hold on
xxx=0:1:82;
plot(xxx,P2(1)*xxx+P2(2))
```

Then, I repeat all steps as in the first code. Resulting graph is below. Line of the best fit is noticeably different from the first one.