HW1 Report

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Here, I include the code and the output but the m.files and the diary can be found in the directory.

1

```
X=[1, 1.5, 3, 4, 5, 7, 9, 10];
Y1=-2+0.5*X
Y2=-2+0.5*(X.^2)

plot(X,Y1,'--ko',X,Y2,':b*');
legend('Y1', 'Y2')
```

This is the output:

```
ece_hw1_1

Y1 =
```

−1.5000 −1.2500 −0.5000 0 0.5000 1.5000 2.5000 3.0000

Y2 =

−1.5000 −0.8750 2.5000 6.0000 10.5000 22.5000 38.5000 48.0000

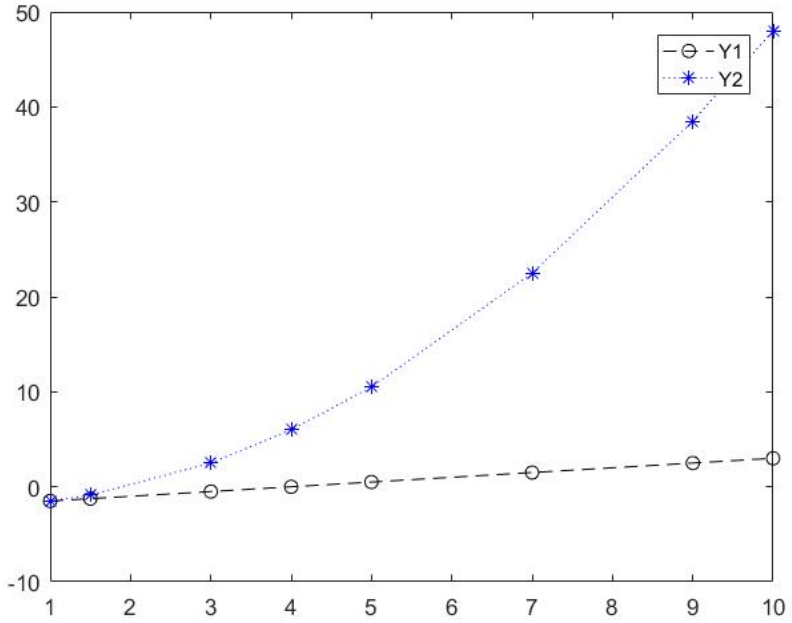

Figure 1:

2

```
X= linspace(-10,20,200)
sumX=sum(X)
```

This is the output:

ece_hw1_2

X =

Columns 1 through 12

−10.0000 −9.8492 −9.6985 −9.5477 −9.3970 −9.2462 −9.0955
−8.9447 −8.7940 −8.6432 −8.4925 −8.3417

Columns 13 through 24

−8.1910 −8.0402 −7.8894 −7.7387 −7.5879 −7.4372 −7.2864 −7.1357
−6.9849 −6.8342 −6.6834 −6.5327

Columns 25 through 36

−6.3819 −6.2312 −6.0804 −5.9296 −5.7789 −5.6281 −5.4774 −5.3266
−5.1759 −5.0251 −4.8744 −4.7236

Columns 37 through 48

−4.5729 −4.4221 −4.2714 −4.1206 −3.9698 −3.8191 −3.6683 −3.5176
−3.3668 −3.2161 −3.0653 −2.9146

Columns 49 through 60

−2.7638 −2.6131 −2.4623 −2.3116 −2.1608 −2.0101 −1.8593 −1.7085
−1.5578 −1.4070 −1.2563 −1.1055

Columns 61 through 72

−0.9548 −0.8040 −0.6533 −0.5025 −0.3518 −0.2010 −0.0503
0.1005 0.2513 0.4020 0.5528 0.7035

Columns 73 through 84

0.8543 1.0050 1.1558 1.3065 1.4573 1.6080 1.7588 1.9095
2.0603 2.2111 2.3618 2.5126

Columns 85 through 96

2.6633 2.8141 2.9648 3.1156 3.2663 3.4171 3.5678 3.7186
3.8693 4.0201 4.1709 4.3216

Columns 97 through 108

4.4724 4.6231 4.7739 4.9246 5.0754 5.2261 5.3769 5.5276
5.6784 5.8291 5.9799 6.1307

Columns 109 through 120

6.2814 6.4322 6.5829 6.7337 6.8844 7.0352 7.1859 7.3367
7.4874 7.6382 7.7889 7.9397

Columns 121 through 132

8.0905 8.2412 8.3920 8.5427 8.6935 8.8442 8.9950 9.1457
9.2965 9.4472 9.5980 9.7487

Columns 133 through 144

9.8995 10.0503 10.2010 10.3518 10.5025 10.6533 10.8040 10.9548
11.1055 11.2563 11.4070 11.5578

Columns 145 through 156

11.7085 11.8593 12.0101 12.1608 12.3116 12.4623 12.6131 12.7638
12.9146 13.0653 13.2161 13.3668

Columns 157 through 168

13.5176 13.6683 13.8191 13.9698 14.1206 14.2714 14.4221 14.5729
14.7236 14.8744 15.0251 15.1759

Columns 169 through 180

15.3266 15.4774 15.6281 15.7789 15.9296 16.0804 16.2312 16.3819
16.5327 16.6834 16.8342 16.9849

Columns 181 through 192

17.1357 17.2864 17.4372 17.5879 17.7387 17.8894 18.0402 18.1910
18.3417 18.4925 18.6432 18.7940

```
Columns 193 through 200

   18.9447   19.0955   19.2462   19.3970   19.5477   19.6985   19.8492   20.0000


sumX =

   1000
```

3

```
A=[2,4,6; 1,7,5; 3,12,4];
b=[-2;3;10];
C=A'*b
D=(inv(A'*A))*b
E=sum(b'*A)
F=A([1 3],[1,2])
x=A\b
```

This is the output:

```
ece_hw1_3

C =

   29
   133
   43
```

D =

-3.2505

0.3961

0.8037

E =

205

F =

$2 \quad 4$

$3 \quad 12$

x =

-0.1622

1.2432

-1.1081

4

```
A=[2,4,6;  1,7,5;  3,12,4];
C=eye(5);
B=kron(C,A)
```

The output:

```
ece_hw1_4

B =

    2    4    6    0    0    0    0    0    0    0    0    0
    0    0    0
    1    7    5    0    0    0    0    0    0    0    0    0
    0    0    0
    3   12    4    0    0    0    0    0    0    0    0    0
    0    0    0
    0    0    0    2    4    6    0    0    0    0    0    0
    0    0    0
    0    0    0    1    7    5    0    0    0    0    0    0
    0    0    0
    0    0    0    3   12    4    0    0    0    0    0    0
    0    0    0
    0    0    0    0    0    0    2    4    6    0    0    0
    0    0    0
    0    0    0    0    0    0    1    7    5    0    0    0
    0    0    0
    0    0    0    0    0    0    3   12    4    0    0    0
    0    0    0
    0    0    0    0    0    0    0    0    0    2    4    6
```

```
0     0     0
0     0     0     0     0     0     0     0     0     1     7     5
0     0     0
0     0     0     0     0     0     0     0     0     3    12     4
0     0     0
0     0     0     0     0     0     0     0     0     0     0     0
2     4     6
0     0     0     0     0     0     0     0     0     0     0     0
1     7     5
0     0     0     0     0     0     0     0     0     0     0     0
3    12     4
```

5

```
C=zeros(5,3);
A=random('norm',10,5,size(C))
B=A>=10
```

The output:

```
ece_hw1_5

A =

    8.9752   13.3575   15.1735
    9.3793    3.9626   13.6344
   17.4485   13.5862    8.4828
   17.0452   18.1512   11.4694
```

```
17.0860    12.4445     6.0636
```

B =

```
0    1    1
0    0    1
1    1    0
1    1    1
1    1    0
```

6

```
%imported the data
%excluded rows with blank or unimportable cells
%4389 data points are left
betanot=ones(4389, 1);
X=[betanot, VarName3, VarName4, VarName6];
Y=VarName5;
beta=(inv(X'*X))*(X'*Y)

error=Y-(X*beta);
errorsq= error.^2;
cov=sum((errorsq)/(length(Y)-3))*inv(X'*X);
stderror= [sqrt(cov(1,1)), sqrt(cov(2,2)), sqrt(cov(3,3)), sqrt(cov(4,4))]
```

The output:

```
ece_hw1_6

beta =

0.0825
0.1198
0.1399
0.0294


stderror =

0.0167    0.0063    0.0085    0.0018
```