

ECON 512

Homework 1

Pin Sun*

September 3, 2018

Problem 1

Code:

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

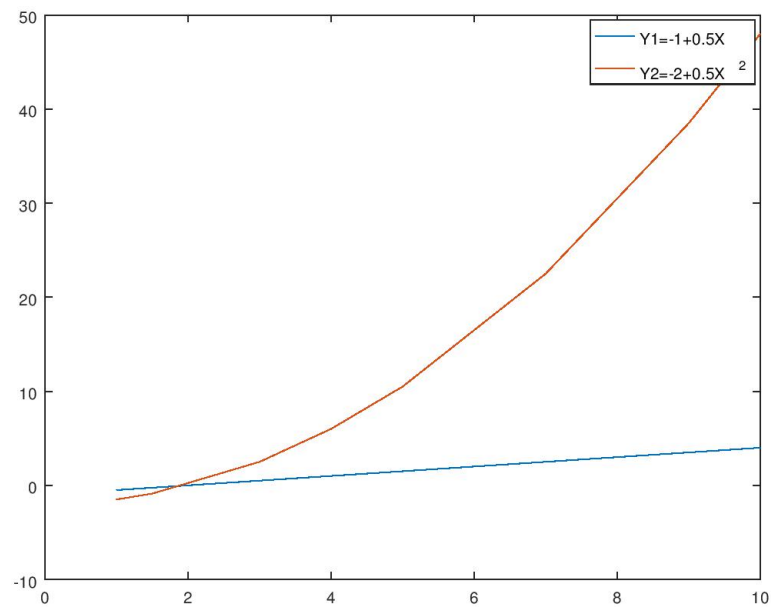


Figure 1

*pxs251@psu.edu

Problem 2

Code:

```
>> X=linspace(-10,20,200)';  
>> sum(X)  
ans = 1000.0
```

Problem 3

- >> A=[2 4 6; 1 7 5; 3 12 4];
>> b=[-2;3;10];
>> C=A'*b
C =
29
133
43
- >> AA=A'*A;
>> D=AA\b
D =
-3.25055
0.39609
0.80369
- >> Ab=A'*b;
>> E=sum(Ab)
E = 205
- >> F=A;
>> F(:,3)=[];
>> F(2,:)=[];
>> F
F =
2 4
3 12
- >> x=A\b
x =
-0.16216
1.24324
-1.10811

Problem 4

```
>> B=blkdiag(diag(diag(A)),diag(diag(A)),diag(diag(A)), ...  
diag(diag(A)),diag(diag(A)))  
B =  
2   0   0   0   0   0   0   0   0   0   0   0   0   0   0  
0   7   0   0   0   0   0   0   0   0   0   0   0   0   0  
0   0   4   0   0   0   0   0   0   0   0   0   0   0   0  
0   0   0   2   0   0   0   0   0   0   0   0   0   0   0  
0   0   0   0   7   0   0   0   0   0   0   0   0   0   0  
0   0   0   0   0   4   0   0   0   0   0   0   0   0   0  
0   0   0   0   0   0   2   0   0   0   0   0   0   0   0  
0   0   0   0   0   0   0   7   0   0   0   0   0   0   0  
0   0   0   0   0   0   0   0   4   0   0   0   0   0   0  
0   0   0   0   0   0   0   0   0   2   0   0   0   0   0  
0   0   0   0   0   0   0   0   0   0   7   0   0   0   0  
0   0   0   0   0   0   0   0   0   0   0   4   0   0   0  
0   0   0   0   0   0   0   0   0   0   0   0   2   0   0  
0   0   0   0   0   0   0   0   0   0   0   0   0   7   0  
0   0   0   0   0   0   0   0   0   0   0   0   0   0   4
```

Problem 5

```
>> A=normrnd(10,5,[5,3]);  
>> [n,m]=size(A);  
>> for i=1:n  
for j=1:m  
if A(i,j)<10  
A(i,j)=0;  
else  
A(i,j)=1;  
end  
end  
end  
>> A  
A =  
1   0   0  
0   0   0  
0   0   0  
1   0   0  
1   1   1
```

Problem 6

```
>> data0=csvread('datahw1.csv');
>> [numr,numc]=size(data0);
>> data1=ones(numr,4);
>> data2=zeros(numr,1);
>> for i=1:numr
data1(i,2)=data0(i,3);
data1(i,3)=data0(i,4);
data1(i,4)=data0(i,6);
data2(i,1)=data0(i,5);
end
>> XX=data1'*data1;
>> betahat=XX\data1'*data2
betahat =
0.081731
0.120132
0.139925
0.029492
>> err2hat=sum((data2-data1*betahat)'*(data2-data1*betahat))/(numr-4)
err2hat = 0.031871
>> varbetahat=XX\ (err2hat*eye(4))
varbetahat =
2.7984e-004  1.5297e-005  5.7253e-005  -2.9212e-005
1.5297e-005  3.9996e-005  -1.3573e-005  -2.7920e-006
5.7253e-005  -1.3573e-005  7.2919e-005  -6.6201e-006
-2.9212e-005  -2.7920e-006  -6.6201e-006  3.1823e-006
```