
Table of Contents

Linear	1
Transpose	1
Inverse	1
Equality	2
Solve	2
Linear Least Squares	2
Paragraph Summary	4

Linear

```
% Part a
a1=[3,1,2;-1,1,1];
a2=[1;2;1];
% a1.*a2;
% Not possible - array sizes don't match
```

```
% Part b
b1=[2,1,0,1;1,0,1,1];
b2=[1;2;1;4];
% b1.*b2;
% Not possible - array sizes don't match
```

```
% Part c
c1=[1;2;1];
c2=[3,1,2;-1,1,1];
% c1.*c2;
% Not possible - array sizes don't match
```

```
% Part d
d1=[1,0,0;0,1,0;0,0,1];
d2=[1;2;1];
d1.*d2;
```

Transpose

```
e=[2,-1;1,4;3,2]';
f=[2+j,-4,6;7,8-5j,3;7-j,-7,6+3j]';
```

Inverse

```
g=[3,-2;-8,-5];
g_inv=inv(g);
h=[2-j,3+j, 1;4,6-8j,0;-1-j,1,4];
h_inv=inv(h);
```

Equality

```
h*h_inv;  
% This gives the identity matrix:  
%{  
1 0 0  
0 1 0  
0 0 1  
%}
```

Solve

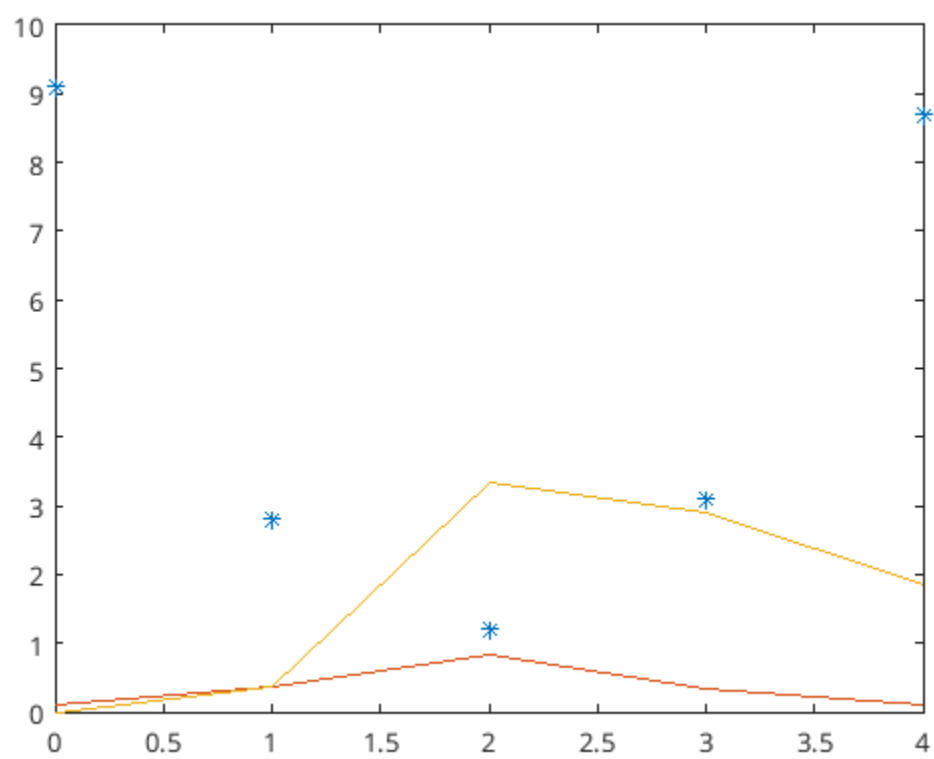
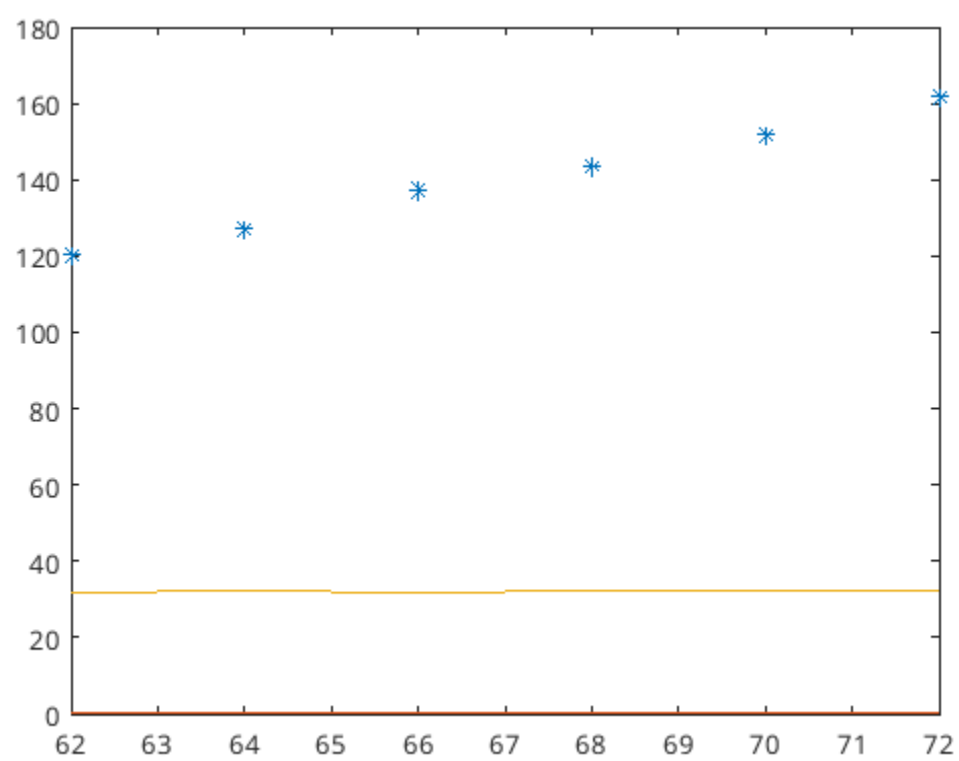
```
syms x y z  
eqn1=x-3*y+2*z==1;  
eqn2=2*x+y+11*z==5;  
eqn3=-3*x+y-z==4;  
eqns=[eqn1 eqn2 eqn3];  
solve(eqns);  
% x=-21/3 y=-12/13 z=-1/13
```

```
eqn1=2*x+y+z==1;  
eqn2=x+2*y+z==2;  
eqn3=-x+4*y==1;  
eqns=[eqn1 eqn2 eqn3];  
solve(eqns);  
% x=-5/3 y=-2/3 z=5
```

Linear Least Squares

```
x1=[62,64,66,68,70,72];  
y1=[120.5,127.2,137.1,143.3,151.8,161.7];  
X1=[ones(length(x1),1),(x1.')]';  
B1=X1./y1. ';  
ID1=X1.*B1;  
figure(1)  
plot(x1,y1,'* ',x1,ID1,'- ');
```

```
x2=[0,1,2,3,4];  
y2=[9.1,2.8,1.2,3.1,8.7];  
X2=[ones(length(x2),1),(x2.')]';  
B2=X2./y2. ';  
ID2=X2.*B2;  
figure(2)  
plot(x2,y2,'* ',x2,ID2,'- ');
```



Paragraph Summary

%{

This portion of the lab served to introduce us to basic linear algebra concepts that we will need throughout the semester as we progress this class. We were able to practice a variety of techniques for manipulating matrices and determining their interactions among each other. This exercise helped us gain experience multiplying matrices, transposing matrices, finding their inverse, taking the determinants of matrices, and solving using the method of linear least squares.

%}

Published with MATLAB® R2023b