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# Software Implementation Techniques Lab1

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## Find eigenvalue and eigen vector

```
clc,clear;
a=magic(4)
[v,d]=eig(a);
disp('Eigen Values')
disp(v);
disp('Eigen Vectors')
disp(d);
```

*a =*

16	2	3	13
5	11	10	8
9	7	6	12
4	14	15	1

*Eigen Values*

-0.5000	-0.8236	0.3764	-0.2236
-0.5000	0.4236	0.0236	-0.6708
-0.5000	0.0236	0.4236	0.6708
-0.5000	0.3764	-0.8236	0.2236

*Eigen Vectors*

34.0000	0	0	0
0	8.9443	0	0
0	0	-8.9443	0
0	0	0	-0.0000

## sum of all the elements of a matrix

```
a=magic(4)
S=sum(a)
```

a =

16	2	3	13
5	11	10	8
9	7	6	12
4	14	15	1

S =

34	34	34	34
----	----	----	----

## save only second row of magic 4 matrix

```
a=magic(4)
z=a(2,:)
```

a =

16	2	3	13
5	11	10	8
9	7	6	12
4	14	15	1

z =

5	11	10	8
---	----	----	---

## 2nd and 4th column elements into z matrix

```
a=magic(4)
z=a(:,[2 4])
```

a =

16	2	3	13
5	11	10	8
9	7	6	12
4	14	15	1

z =

2	13
11	8
7	12
14	1

## corner elements of the magic 4 in a matrix

```
a=magic(4)
z=a([1 4],[1 4])
```

a =

16	2	3	13
5	11	10	8
9	7	6	12
4	14	15	1

z =

16	13
4	1

## for any number of row and column find the end and 1st elements

```
a=magic(4)
z=a([1 end],[1 end])
```

a =

16	2	3	13
5	11	10	8
9	7	6	12
4	14	15	1

z =

16	13
4	1

## now convert all elements of 1st row to -1

```
a=magic(4)
```

```
a(1,:)= -1
```

```
a =
```

```
16     2     3    13
 5    11    10     8
 9     7     6    12
 4    14    15     1
```

```
a =
```

```
-1    -1    -1    -1
 5    11    10     8
 9     7     6    12
 4    14    15     1
```

## delete second row

```
a=magic(4)
a(2,:)=[]
```

```
a =
```

```
16     2     3    13
 5    11    10     8
 9     7     6    12
 4    14    15     1
```

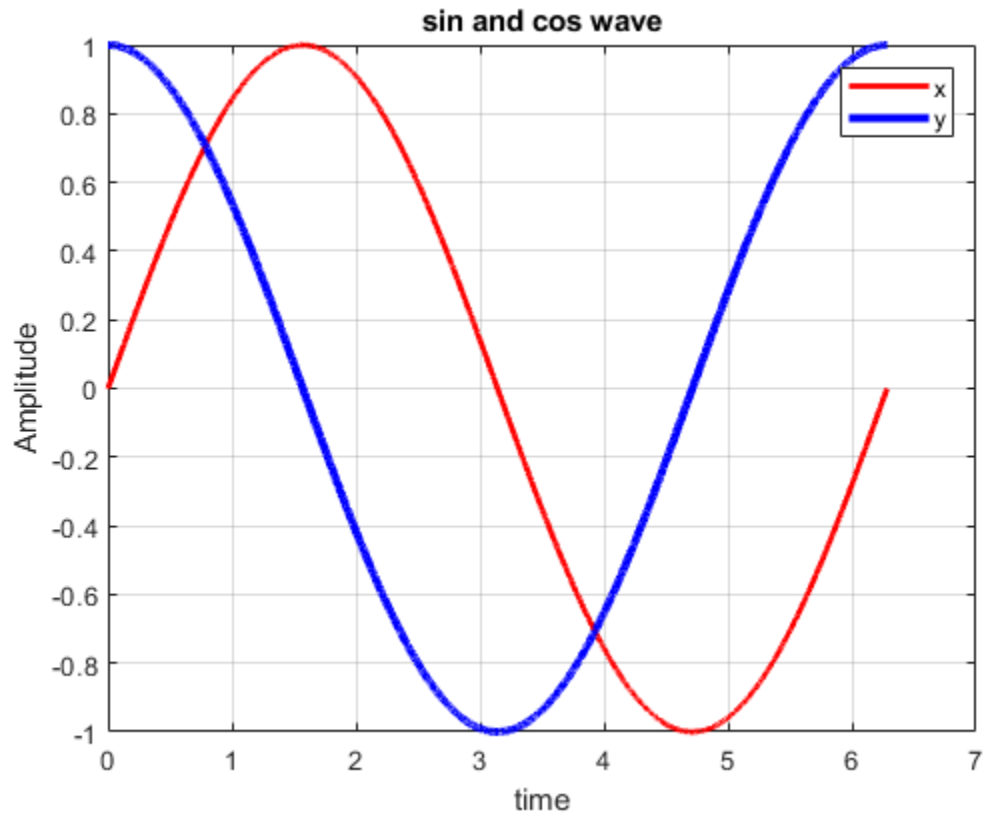
```
a =
```

```
16     2     3    13
 9     7     6    12
 4    14    15     1
```

## plot a sine and cos wave on the same graph

```
clc;
clear all;
close all;
clf;
t=0:0.0005:2*pi;
x=sin(t);
y=cos(t);
plot(t,x,'r','LineWidth',2);
hold on;
plot(t,y,'b','LineWidth',3);
grid on;
```

```
xlabel('time');  
ylabel('Amplitude');  
title('sin and cos wave');  
legend('x','y');
```



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