JNTUH COLLEGE OF ENGINEERING HYDERABAD

MATLAB

1.BASIC OPERATIONS ON MATRICES

* a=[1 3 4;2 5 1;6 9 5]

a =

1 3 4

2 5 1

6 9 5

b=[2 8 5;4 8 2;8 0 3];

>> a+b

ans =

3 11 9

6 13 3

14 9 8

>> a-b

ans =

-1 -5 -1

-2 -3 -1

-2 9 2

>> a\*b

ans =

46 32 23

32 56 23

88 120 63

>> a.\*b

ans =

2 24 20

8 40 2

48 0 15

>> a/b

ans =

0.9167 -0.5417 0.1667

-0.0167 0.6417 -0.0667

0.5833 0.5417 0.3333

>> a./b

ans =

0.5000 0.3750 0.8000

0.5000 0.6250 0.5000

0.7500 Inf 1.6667

>> a\b

ans =

0.4545 -6.7273 -1.6136

0.6364 4.1818 0.8409

-0.0909 0.5455 1.0227

>> a.\b

ans =

2.0000 2.6667 1.2500

2.0000 1.6000 2.0000

1.3333 0 0.6000

>> a^2

ans =

31 54 27

18 40 18

54 108 58

>> a.^2

ans =

1 9 16

4 25 1

36 81 25

>> a'

ans =

1 2 6

3 5 9

4 1 5

>> a.'

ans =

1 2 6

3 5 9

4 1 5

* EXTRACTION OF MATRICES

>> b(1:1,1:3)

ans =

2 8 5

>> b(1:3,1:1)

ans =

2

4

8

>> b(1:2,1:2)

ans =

2 8

4 8

>> b(2:3,2:3)

ans =

8 2

0 3

>> inv(b)

ans =

-0.1000 0.1000 0.1000

-0.0167 0.1417 -0.0667

0.2667 -0.2667 0.0667

>> size(b)

ans =

3 3

>> det(b)

ans =

-240

* SOLVING LINEAR EQUATIOS

a =

3 4 -2 2

4 9 -3 5

-2 -3 7 5

1 4 6 7

>> b=[2;8;10;2];

>> x=inv(a)\*b

x =

-2.4000

-2.0857

-3.7429

5.0286

a =

2 8 5

4 8 2

8 0 3

>> e=eig(a)

e =

-4.5172

13.6149

3.9023

2.BASIC GENERATION OF SIGNALS

* UNIT STEP
* t=-5:.01:5;
* a=[zeros(1,500) ones(1,501)];
* plot(t,a);
* xlabel('time')
* ylabel('amplitude')
* title('UNIT STEP')
* 
* UNIT IMPLUSE
* t=-5:.01:5;
* y=[zeros(1,500) ones(1) zeros(1,500)];
* xlabel('time');
* ylabel('Amplitude');
* title('impulse');
* plot(t,y);
* 
* UNIT RAMP
* t=0:.01:5;
* y=t;
* plot(t,y);
* xlabel('time');
* ylabel('Amplitude');
* title('impulse');
* 
* PARABOLIC FUNCTION
* t=-5:.01:5;
* y=t.^2/2;
* plot(t,y);
* xlabel('time');
* ylabel('Amplitude');
* title('parabolic');
* 
* SIGNUM FUNCTION
* t=-5:.01:5;
* y=sign(t);
* plot(t,y);
* xlabel('time');
* ylabel('Amplitude');
* title('SIGNUM');
* 
* EXPONENTIAL FUNCTION
* t=-5:.01:5;
* y=exp(t);
* plot(t,y);
* xlabel('time');
* ylabel('Amplitude');
* title('EXPONENTIAL');
* 
* SIN FUNCTION
* t=-2\*pi:.001:2\*pi;
* y=sin(t);
* plot(t,y);
* xlabel('time');
* ylabel('Amplitude');
* title('SIN FUNCTION')
* 
* RECTANGULAR FUNCTION

t=0:.01:5;

y=[zeros(1,100) ones(1,300) zeros(1,101)];

plot(t,y);

xlabel('time');

ylabel('Amplitude');

title('RECTANGULAR');

* 
* SINC FUNCTION
* t=-2\*pi:.01:2\*pi;
* y=sinc(t);
* plot(t,y);
* xlabel('time');
* ylabel('Amplitude');
* title('SINC');
* 
* TRIANGULAR FUNCTION
* clc
* clear all
* close all
* t=0:0.001:1;
* l=length(t);
* for i=1:l;
* if t(i)<.5
* u(i)=t(i);
* elseif t(i)>=.5
* u(i)=1-t(i);
* end
* end
* plot(t,u);
* xlabel('time')
* ylabel('amplitude')
* title('TRIANGULAR')
* 
* SQUARE FUNCTION
* t=-5:.001:5;
* y=square(t);
* xlabel('time');
* ylabel('Amplitude');
* title('SQUARE FNCTION');
* plot(t,y);
* 

3.SUM OF THE SIGNALS

* clear all;
* n=input('c=');
* t=-n:.01:n;
* a=input('enyer the first signal');
* b=input('enter the 2nd signal');
* out=a+b;
* disp('out');
* xlabel('time');
* ylabel('amplitude');
* title('SIGNAL 1');
* subplot(3,3,1);
* stem(t,a);
* xlabel('time');
* ylabel('amplitude');
* title('SGNAL 2');
* subplot(3,3,2);
* stem(t,b);
* xlabel('title');
* ylabel('amplitude');
* title('sum');
* subplot(3,3,3);
* stem(t,out);
* c=pi
* enyer the first signalsin(t)
* enter the 2nd signalsinc(t)
* out
* 

4.ODD AND EVEN PARTS OF A SIGNAL

* n=input('c=');
* t=-n:.1:n;
* a=input('enter the signal')
* xlabel('time');
* ylabel('amplitude');
* title('orginal signal');
* subplot(3,1,1);
* stem(t,a);
* b=fliplr(a);
* d=(a+b)\*.5;
* xlabel('time');
* ylabel('ampltude');
* title('even signal');
* subplot(3,1,2);
* stem(t,d);
* e=(a-b)\*.5;
* xlabel('time');
* ylabel('amplitude');
* title('odd signal');
* subplot(3,1,3);
* stem(t,e);
* c=5
* enter signalsin(t)
* 

5.ORTHOGNALITY OF TWO SIGNALS

claer all;

syms t

a=input('ist signal');

b=input('2nd=');

t1=input('tmin=');

t2=input('tmax=');

x1=int(a\*b,t1,t2);

if(x1==0)

disp('orthogonal');

else

disp('not orthogonal');

end;

1st signalsin(2\*pi\*t)

2nd=cos(3\*pi\*t/2)

tmin=0

tmax=3

non orthogonal

6.SHIFTING OF GENERAL SIGNALS

clear all;

n1=input('min=');

n2=input('max=');

for i=1:2

n=input('for orginal n=0,if shifted n=');

if n==0;

t1=n1+n:.001:n2+n;

x=input('signal=');

a=x;

b=t1;

else

t2=n1+n:.001:n2+n;

t1=t2;

y=x;

end;

end;

subplot(2,1,1);

plot(b,a);

xlabel('time');

ylabel('amplitude');

title('MAIN SIGNAL');

subplot(2,1,2);

plot(t2,y);

xlabel('time');

ylabel('amplitude');

title('SHIFTED SIGNAL');



clear all;

n1=input('min=');

n2=input('max=');

for i=1:2

n=input('for orginal n=0,if shifted n=');

if n==0;

t1=n1+n:.001:n2+n;

x=input('signal=');

a=x;

b=t1;

else

t2=n1+n:.001:n2+n;

t1=t2;

y=x;

end;

end;

subplot(2,1,1);

plot(b,a);

xlabel('time');

ylabel('amplitude');

title('MAIN SIGNAL');

subplot(2,1,2);

plot(t2,y);

xlabel('time');

ylabel('amplitude');

title('SHIFTED SIGNAL');

min=0

max=10

for orginal n=0,if shifted n=0

signal=(t1/2.5).\*(t1<2.5)+((5-t1)/2.5).\*(t1>=2.5&t1<5)+((5-t1)/2.5).\*(t1>=5&t1<7.5)+((t1-10)/2.5).\*(t1>=7.5&t1<=10)

for orginal n=0,if shifted n=10



clear all;

n1=input('min=');

n2=input('max=');

for i=1:2

n=input('for orginal n=0,if shifted n=');

if n==0;

t1=n1+n:.001:n2+n;

x=input('signal=');

a=x;

b=t1;

else

t2=n1+n:.001:n2+n;

t1=t2;

y=x;

end;

end;

subplot(2,1,1);

plot(b,a);

xlabel('time');

ylabel('amplitude');

title('MAIN SIGNAL');

subplot(2,1,2);

plot(t2,y);

xlabel('time');

ylabel('amplitude');

title('SHIFTED SIGNAL');



clear all;

n1=input('min=');

n2=input('max=');

for i=1:2

n=input('for orginal n=0,if shifted n=');

if n==0;

t1=n1+n:.001:n2+n;

x=input('signal=');

a=x;

b=t1;

else

t2=n1+n:.001:n2+n;

t1=t2;

y=x;

end;

end;

subplot(2,1,1);

plot(b,a);

xlabel('time');

ylabel('amplitude');

title('MAIN SIGNAL');

subplot(2,1,2);

plot(t2,y);

xlabel('time');

ylabel('amplitude');

title('SHIFTED SIGNAL');

min=0

max=8

for orginal n=0,if shifted n=0

signal=t1.\*(t1<2+n)+2.\*(t1>=2+n&t1<4+n)+(t1-2).\*(t1>=4+n&t1<6+n)-5.\*(t1>=6+n&t1<8+n)

for orginal n=0,if shifted n=10



clear all;

n1=input('min=');

n2=input('max=');

for i=1:2

n=input('for orginal n=0,if shifted n=');

if n==0;

t1=n1+n:.001:n2+n;

x=input('signal=');

a=x;

b=t1;

else

t2=n1+n:.001:n2+n;

t1=t2;

y=x;

end;

end;

subplot(2,1,1);

plot(b,a);

xlabel('time');

ylabel('amplitude');

title('MAIN SIGNAL');

subplot(2,1,2);

plot(t2,y);

xlabel('time');

ylabel('amplitude');

title('SHIFTED SIGNAL');



**7.SCALING OF GENERAL SIGNALS**

clear all;

n1=input('min=');

n2=input('max=');

for i=1:2

n=input('for orginal n=1,if not scaled n=');

if n==1;

t1=n1\*n:.001:n2\*n;

x=input('signal=');

a=x;

b=t1;

else

t2=n1\*n:.01:n2\*n;

t1=t2;

y=x;

end;

end;

subplot(2,1,1);

plot(b,a);

xlabel('time');

ylabel('amplitude');

title('MAIN SIGNAL');

subplot(2,1,2);

plot(t2,y);

xlabel('time');

ylabel('amplitude');

title('SCALED');

min=0

max=10

for orginal n=1,if not scaled n=1

signal=1.\*(t1<5\*n)-1.\*(t1>=5\*n&t1<10\*n)

for orginal n=1,if not scaled n=10



clear all;

n1=input('min=');

n2=input('max=');

for i=1:2

n=input('for orginal n=1,if not scaled n=');

if n==1;

t1=n1\*n:.001:n2\*n;

x=input('signal=');

a=x;

b=t1;

else

t2=n1\*n:.01:n2\*n;

t1=t2;

y=x;

end;

end;

subplot(2,1,1);

plot(b,a);

xlabel('time');

ylabel('amplitude');

title('MAIN SIGNAL');

subplot(2,1,2);

plot(t2,y);

xlabel('time');

ylabel('amplitude');

title('SCALED');

min=0

max=10

for orginal n=1,if not scaled n=1

signal=(t1/2.5).\*(t1<2.5)+((5-t1)/2.5).\*(t1>=2.5&t1<5)+((5-t1)/2.5).\*(t1>=5&t1<7.5)+((t1-10)/2.5).\*(t1>=7.5&t1<=10)

for orginal n=1,if not scaled n=10



clear all;

n1=input('min=');

n2=input('max=');

for i=1:2

n=input('for orginal n=1,if not scaled n=');

if n==1;

t1=n1\*n:.0001:n2\*n;

x=input('signal=');

a=x;

b=t1;

else

t2=n1\*n:.001:n2\*n;

t1=t2;

y=x;

end;

end;

subplot(2,1,1);

plot(b,a);

xlabel('time');

ylabel('amplitude');

title('MAIN SIGNAL');

subplot(2,1,2);

plot(t2,y);

xlabel('time');

ylabel('amplitude');

title('SCALED');

min=0

max=8

for orginal n=1,if not scaled n=1

signal=1.\*(t1<2\*n)+2.\*(t1>=2\*n&t1<4\*n)-2.\*(t1>=4\*n&t1<6\*n)-1.\*(t1>=6&t1<8)

for orginal n=1,if not scaled n=10



clear all;

n1=input('min=');

n2=input('max=');

for i=1:2

n=input('for orginal n=1,if not scaled n=');

if n==1;

t1=n1\*n:.001:n2\*n;

x=input('signal=');

a=x;

b=t1;

else

t2=n1\*n:.01:n2\*n;

t1=t2;

y=x;

end;

end;

subplot(2,1,1);

plot(b,a);

xlabel('time');

ylabel('amplitude');

title('MAIN SIGNAL');

subplot(2,1,2);

plot(t2,y);

xlabel('time');

ylabel('amplitude');

title('SCALED');

min=0

max=8

for orginal n=1,if not scaled n=1

signal=t1.\*(t1<2\*n)+2.\*(t1>=2\*n&t1<4\*n)+(t1-2).\*(t1>=4\*n&t1<6\*n)-5.\*(t1>=6\*n&t1<8\*n)

for orginal n=1,if not scaled n=10



* clear all;

n1=input('min=');

n2=input('max=');

for i=1:2

n=input('for orginal n=1,if not scaled n=');

if n==1;

t1=n1\*n:.0001:n2\*n;

x=input('signal=');

a=x;

b=t1;

else

t2=n1\*n:.001:n2\*n;

t1=t2;

y=x;

end;

end;

subplot(2,1,1);

plot(b,a);

xlabel('time');

ylabel('amplitude');

title('MAIN SIGNAL');

subplot(2,1,2);

plot(t2,y);

xlabel('time');

ylabel('amplitude');

title('SCALED');

min=0

max=15

for orginal n=1,if not scaled n=1

signal=t1/5.\*(t1<5\*n)+1.\*(t1>=5\*n&t1<10\*n)+((15-t1)/5).\*(t1>=10\*n&t1<=15\*n)

for orginal n=1,if not scaled n=10

