Octave Convolution Example

camerawatson/octave/conv.m

```
%linear convolution program

clc;
clear all;
close all;
disp('linear convolution program');

x=input('enter i/p x(n):');
m=length(x);
h=input('enter i/p h(n):');
n=length(h);

x=[x,zeros(1,n)];
subplot(2,2,1), stem(x);
title('i/p sequencce x(n)is:');
xlabel('---->n');
ylabel('---->x(n)');grid;

h=[h,zeros(1,m)];
subplot(2,2,2), stem(h);
title('i/p sequencce h(n)is:');
xlabel('---->n');
ylabel('---->h(n)');grid;
disp('convolution of x(n) & h(n) is y(n):');
y=zeros(1,m+n-1);

for i=1:m+n-1
        y(i)=0;
        for j=1:m+n-1
                if(j<i+1)
                        y(i)=y(i)+x(j)*h(i-j+1);
                end
        end
end

y
subplot(2,2,[3,4]),stem(y);
title('convolution of x(n) & h(n) is :');
xlabel('---->n');
ylabel('---->y(n)');grid;
```
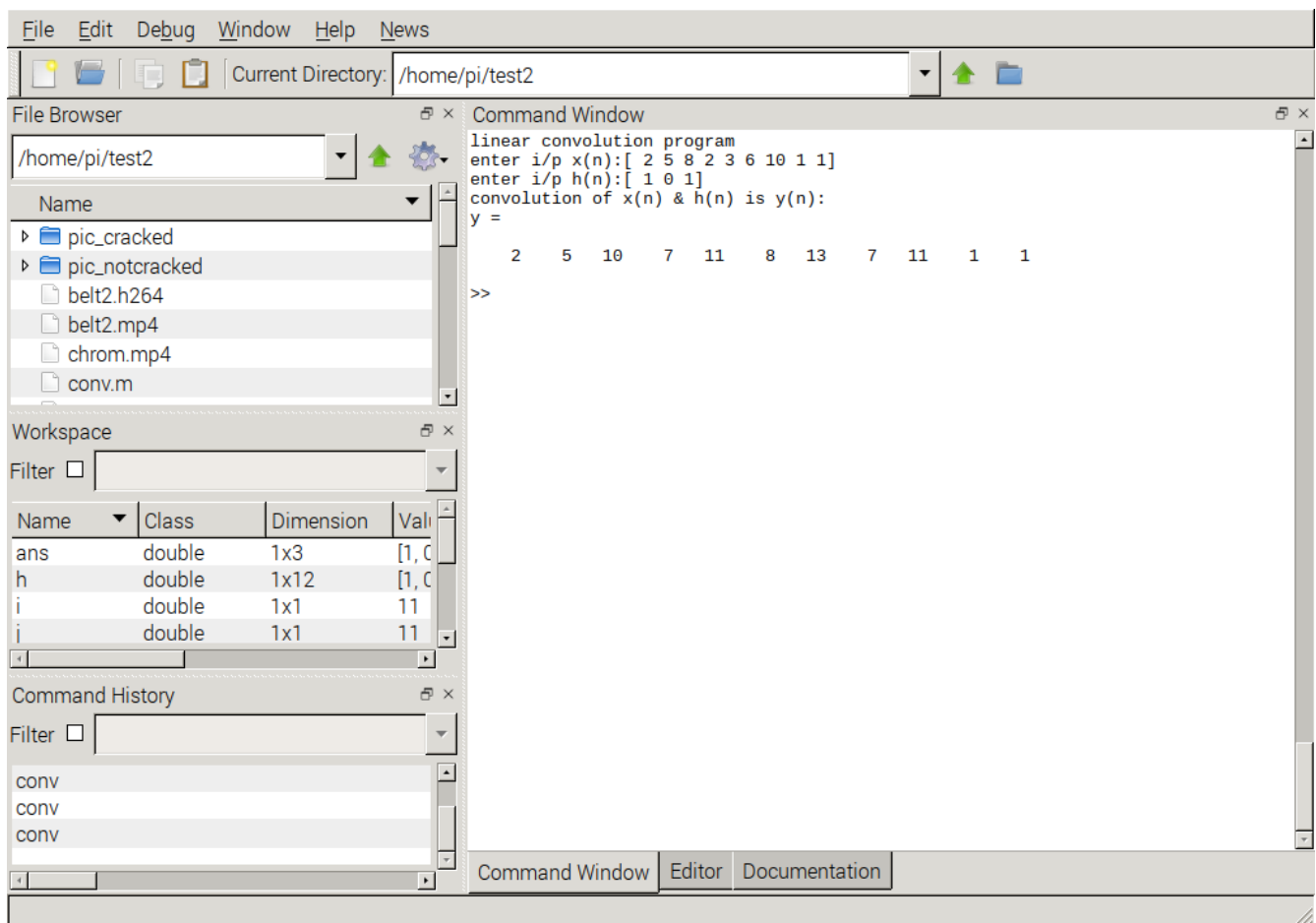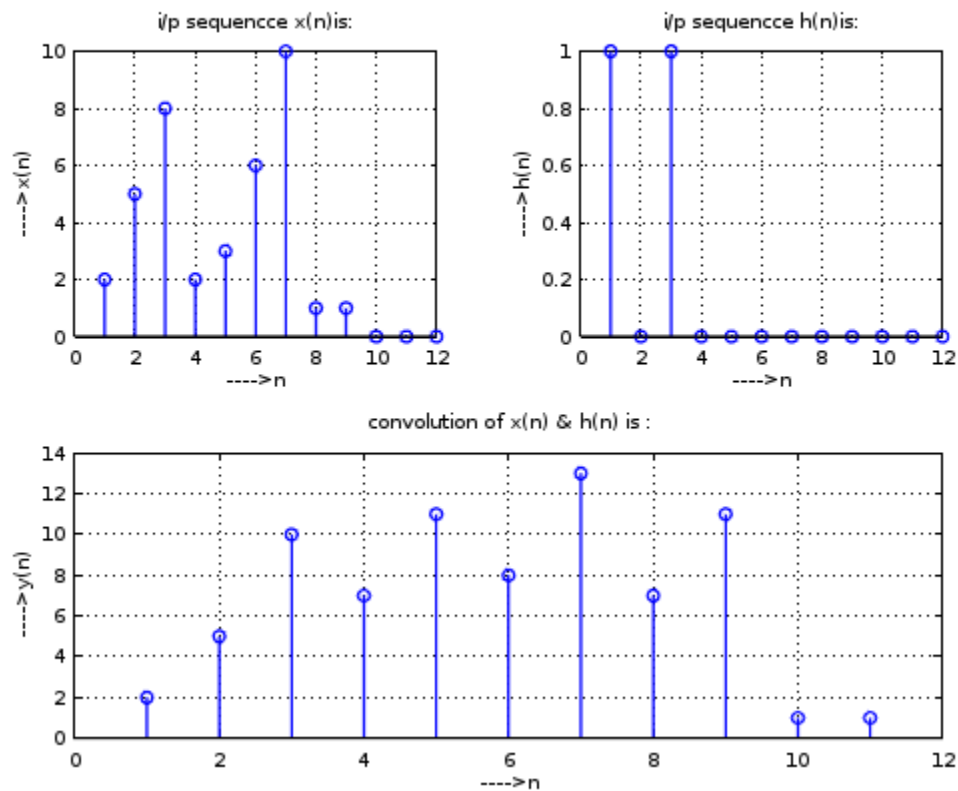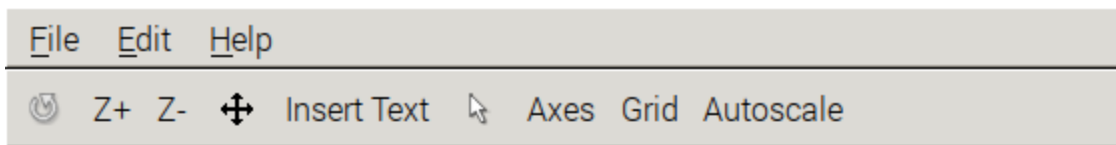
Current Directory: /home/pi/test2

File Browser

/home/pi/test2

Name

▷ 📁 pic_cracked
▷ 📁 pic_notcracked
  📄 belt2.h264
  📄 belt2.mp4
  📄 chrom.mp4
  📄 conv.m

Workspace

Filter ☐

Name	Class	Dimension	Valu
ans	double	1x3	[1, 0
h	double	1x12	[1, 0
i	double	1x1	11
j	double	1x1	11

Command History

Filter ☐

conv
conv
conv

Command Window

```
linear convolution program
enter i/p x(n):[ 2 5 8 2 3 6 10 1 1]
enter i/p h(n):[ 1 0 1]
convolution of x(n) & h(n) is y(n):
y =

    2    5   10    7   11    8   13    7   11    1    1

>>
```

Command Window | Editor | Documentation

Result is 3 plot s in a figure.

Z+   Z-   ✛   Insert Text   ⌕   Axes   Grid   Autoscale

i/p sequencce x(n)is:

---->x(n)

i/p sequencce h(n)is:

--->h(n)

---->n

convolution of x(n) & h(n) is :

---->y(n)

---->n

C implementation

gcc conv_ex.c -o conv_ex

#include<stdio.h>

int x[15],h[15],y[15];

```c
main()
{           int i,j,m,n;

            printf("\n enter value for m");
            scanf("%d",&m);
            printf("\n enter value for n");
            scanf("%d",&n);

            printf("Enter values for i/p x(n):\n");
```

```c
	for(i=0;i<m;i++)
		scanf("%d",&x[i]);


	printf("Enter Values for i/p h(n) \n");
	for(i=0;i<n; i++)
		scanf("%d",&h[i]);



// padding of zeors

for(i=m;i<=m+n-1;i++)

	x[i]=0;

for(i=n;i<=m+n-1;i++)

	h[i]=0;



/* convolution operation */

for(i=0;i<m+n-1;i++)

{

	y[i]=0;

	for(j=0;j<=i;j++)

	{

		y[i]=y[i]+(x[j]*h[i-j]);

	}

}



//displaying the o/p

for(i=0;i<m+n-1;i++)

	printf("\n The Value of output y[%d]=%d",i,y[i]);

}
```

The Value of output y[8]=25devel@mypi3-13:/clusterfs/camerawatson/C $ ./conv_ex

devel@mypi3-13:/clusterfs/camerawatson/C $ ./conv_ex

 enter value for m5

 enter value for n5
Enter values for i/p x(n):
1 2 3 4 5
Enter Values for i/p h(n)
1 2 3 4 5

 The Value of output y[0]=1
 The Value of output y[1]=4
 The Value of output y[2]=10
 The Value of output y[3]=20
 The Value of output y[4]=35
 The Value of output y[5]=44
 The Value of output y[6]=46
 The Value of output y[7]=40

enter value for m9

 enter value for n3
Enter values for i/p x(n):
2 5 8 2 3 6 10 1 1
Enter Values for i/p h(n)
1 0 1

 The Value of output y[0]=2
 The Value of output y[1]=5
 The Value of output y[2]=10
 The Value of output y[3]=7
 The Value of output y[4]=11
 The Value of output y[5]=8
 The Value of output y[6]=13
 The Value of output y[7]=7
 The Value of output y[8]=11
 The Value of output y[9]=1