AVANCES 2

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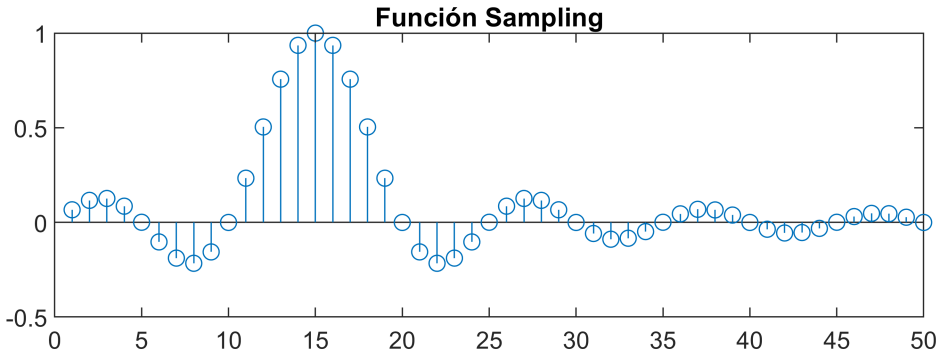
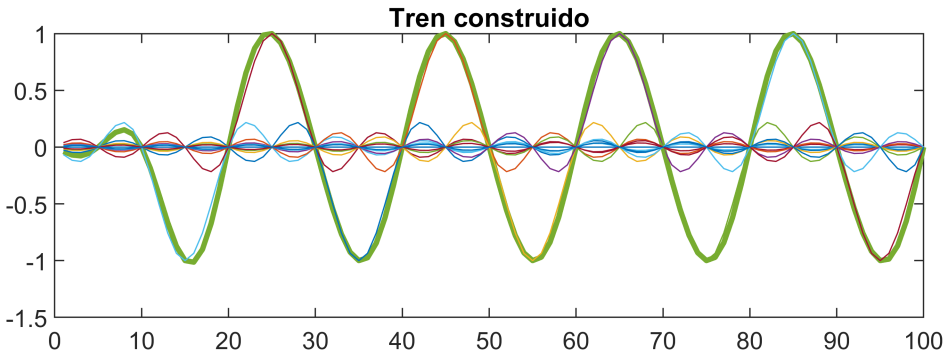
```
clc
close all
clear all
%------------ FUNCIÓN SAMPLING  --------------
n=1:50;
ft=sinc(2*pi*(n-15)/31.4);
figure(1)
tiledlayout('flow')
% Top plot
nexttile
stem(ft)
title('Función Sampling')

k=100;
n=1:k;
nexttile
fn=zeros(1,k);
plot(fn)
for i=1:10:k
    a=(i-1)/10;
    if mod (a,2) == 0 % Si es par, mandará un 0
      fn= fn-sinc(2*pi*(n-15-i+1)/31.4);
      x=-sinc(2*pi*(n-15-i+1)/31.4);
      hold on
      plot(x,'Color',[0,0.7,0.9])
    else % Si es impar, mandará un 1
      fn= fn+sinc(2*pi*(n-15-i+1)/31.4);
       x=sinc(2*pi*(n-15-i+1)/31.4);
       hold on
     plot(x,'Color',[0,0.7,0.9])
    end
end
hold on
plot(fn,'LineWidth',2,'MarkerEdgeColor','k')
title('Tren construido')


%----------------  GRÁFICA TREN DE BITS   -------------------

for i=1:10:k
    a=(i-1)/10;
    if mod (a,2) == 0 % Si es par, mandará un 0
      fn= fn-sinc(2*pi*(n-15-i+1)/31.4);
      x=-sinc(2*pi*(n-15-i+1)/31.4);
      hold on
      plot(x)
    else % Si es impar, mandará un 1
      fn= fn+sinc(2*pi*(n-15-i+1)/31.4);
```

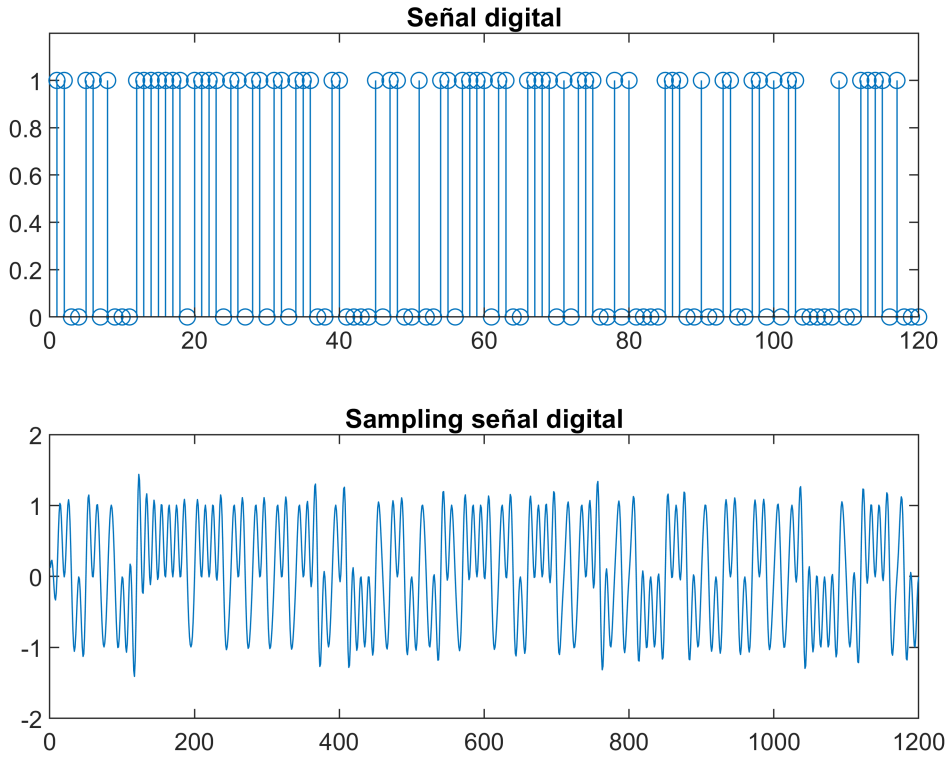
```
        x=sinc(2*pi*(n-15-i+1)/31.4);
        hold on
       plot(x)
    end
end
```





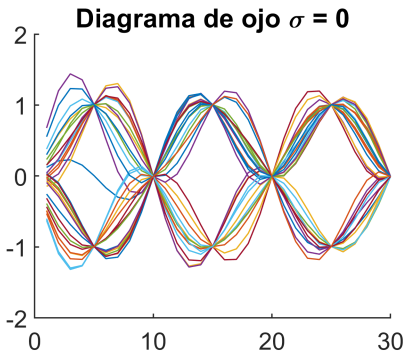

```
% -------------- SECUENCIA DE BITS - ----------
num = randperm(255,15);
numb=cellstr(dec2bin(num));
for i=1:15 %Concatenar secuencia de bits
    if i==1 || i==2
        vec=strcat(numb(1),numb(2));
    else
        vec= strcat(vec,numb(i));
    end
end

vec=char(vec);

%-------------   GRÁFICA SECUENCIA DE BITS    ------------
vec=char(vec);
for i=1:length(vec)
    dig(i)=str2double(vec(i));
end


figure(2)
tiledlayout('flow')
```

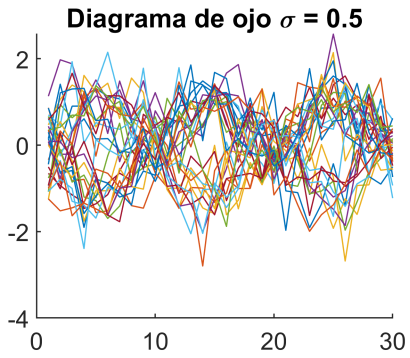
```
nexttile
stem(dig)
title('Señal digital')
ylim([0.00 1.20])

%-------GRÁFICA DE LA SECUENCIA GENERADA  -------------------


k=length(vec)*10;
fdn=zeros(1,k);
n=1:k;
nexttile
plot(fdn)
for i=1:length(vec)
    if vec(i) == '0' % Mandará un 0
      fdn= fdn-sinc(2*pi*(n-5-(i*10))/31.4);
    else % Mandará un 1
      fdn= fdn+sinc(2*pi*(n-5-(i*10))/31.4);
    end
end
plot(fdn)
title('Sampling señal digital')
```

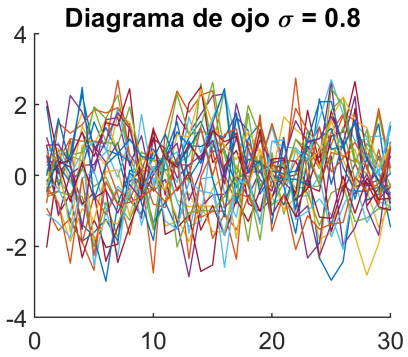


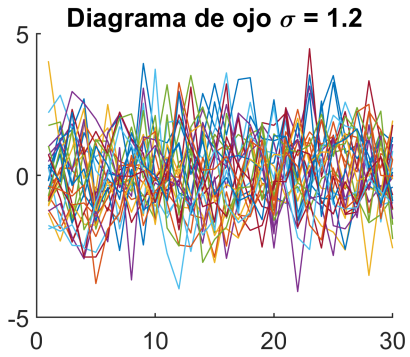

```
%----------------- DIAGRAMA DE OJO SIGMA = 0 -----------------------------

k=length(fdn);
ojo=zeros(1,30);
figure(3)
```

```
tiledlayout('flow')
nexttile

for j=1:40:k
    for i=1:30
        ojo(i)=fdn(j+i-1);
    end
    hold on
    plot(ojo)
end

title('Diagrama de ojo \sigma = 0')

%----------------- DIAGRAMA DE OJO SIGMA = 0.5 ----------------------------
k=length(fdn);

ruido1= fdn+ randn(1,k)*0.5;
ruido2= fdn+ randn(1,k)*0.8;
ruido3 = fdn+ randn(1,k)*1.2;

nexttile
for j=1:40:k
    for i=1:30
        ojo(i)=ruido1(j+i-1);
    end
    hold on
    plot(ojo)
end
title('Diagrama de ojo \sigma = 0.5')


%----------------- DIAGRAMA DE OJO SIGMA = 0.8 ----------------------------

nexttile
for j=1:40:k
    for i=1:30
        ojo(i)=ruido2(j+i-1);
    end
    hold on
    plot(ojo)
end
title('Diagrama de ojo \sigma = 0.8')

%----------------- DIAGRAMA DE OJO SIGMA = 1.2 ----------------------------

nexttile
for j=1:40:k
    for i=1:30
        ojo(i)=ruido3(j+i-1);
    end
    hold on
    plot(ojo)
end
title('Diagrama de ojo \sigma = 1.2')
```

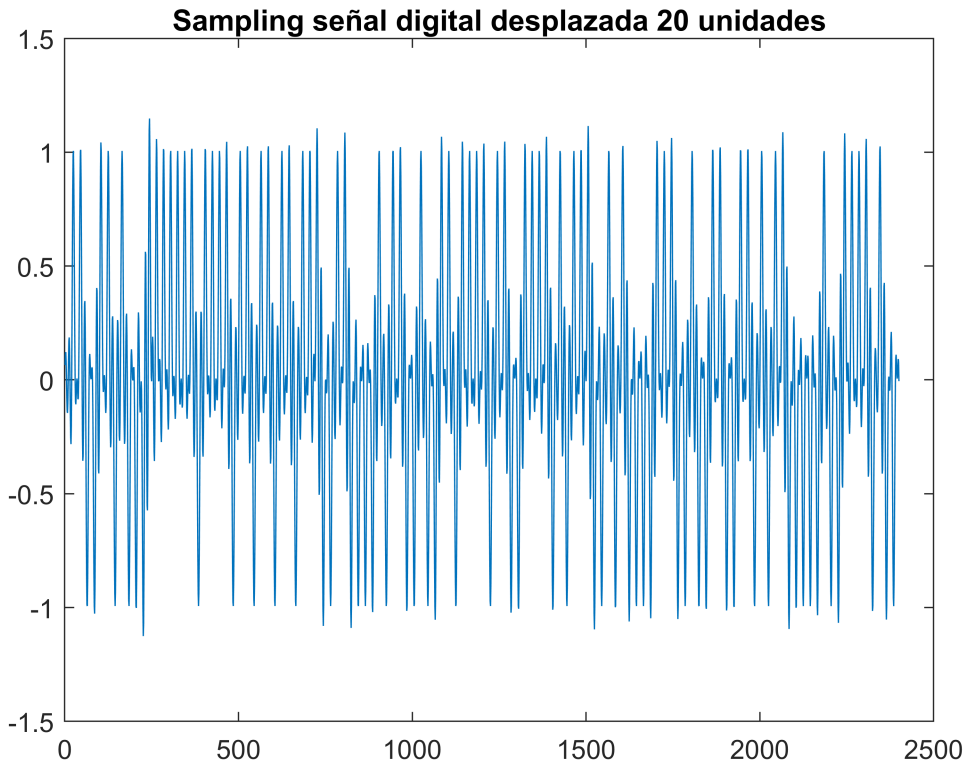









```
%----------------- DESPLAZAMIENTO 20 UNIDADES ---------------------------

k=length(vec)*20;
fdn2=zeros(1,k);
n=1:k;
for i=1:length(vec)
    if vec(i) == '0' % Mandará un 0
      fdn2= fdn2-sinc(2*pi*(n-5-(i*20))/31.4);
    else % Mandará un 1
      fdn2= fdn2+sinc(2*pi*(n-5-(i*20))/31.4);
    end
end
figure(4)
tiledlayout('flow')
nexttile
plot(fdn2)
title('Sampling señal digital desplazada 20 unidades')
```




```
% %----------------- DIAGRAMA DE OJO SIGMA = 0 -----------------------------
% ojo=zeros(1,60);
% nexttile
% for j=1:40:k
%     for i=1:60
%         ojo(i)=fdn(j+i-1);
%     end
%     hold on
%     plot(ojo)
% end
%
% title('Diagrama de ojo \sigma = 0')

%-------------------------  DETECTOR -------------------------------------


k=length(dig);
detectada= zeros(1,k);
jj=1;
while(jj<length(dig))
    for i=15:10:k
         detectada(jj)= fdn(i-1);
         jj=jj+1;
    end
```

```
end

figure (5)
plot(detectada);
title('Señal detectada \sigma = 0')
```