

EXAMEN 1: Alexis Luna Delgado

Ejercicio 5

```
Tp = 1/9450;  
P=[0.0, 0.245, 0.445, 0.545, 0.745, 0.845, 0.945, 0.99, 0.99, 0.945,0.845,0.745,0.545,0.445,0.245,0.0];  
  
mp = numel(P)
```

```
mp = 15
```

```
% a)  
Ts = Tp / mp
```

```
Ts = 7.0547e-06
```

```
% b)  
Fs = 1 / Ts
```

```
Fs = 141750
```

```
% c)  
Ep = Ts*sum(P.^2); %Calculo de Energia  
% d  
  
% e)
```

Ejercicio 6

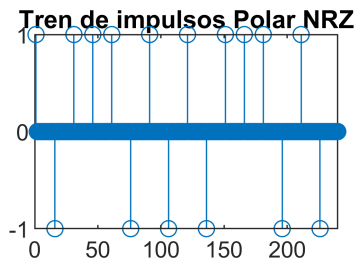
```
load lena512.mat  
imshow(uint8(lena512))
```



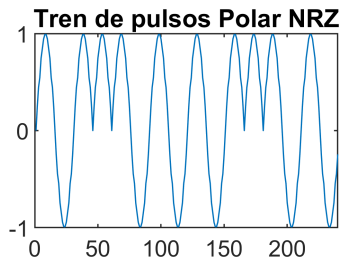
```
lenarec=lena512(252:315,318:381);  
imshow(uint8(lenarec))
```



```
b = de2bi(lenarec,8,'left-msb');  
b=b';  
bits=b(:);    % Vector de bits concatenado  
  
%Baud_rate= Fs/mp %Symbols per second  
%Bit_rate=Baud_rate % bits/s  
pnrz=P;  
s1=bits;  
s1(s1==0)=-1;  
s=zeros(1,numel(s1)*mp);  
s(1:mp:end)=s1; %Impulse train  
stem(s(1:mp*16))  
title('Tren de impulsos Polar NRZ');
```



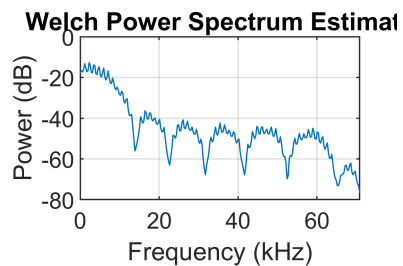
```
xPNRZ=conv(pnrz,s); %Pulse train
plot(xPNRZ(1:mp*16))
title('Tren de pulsos Polar NRZ');
```



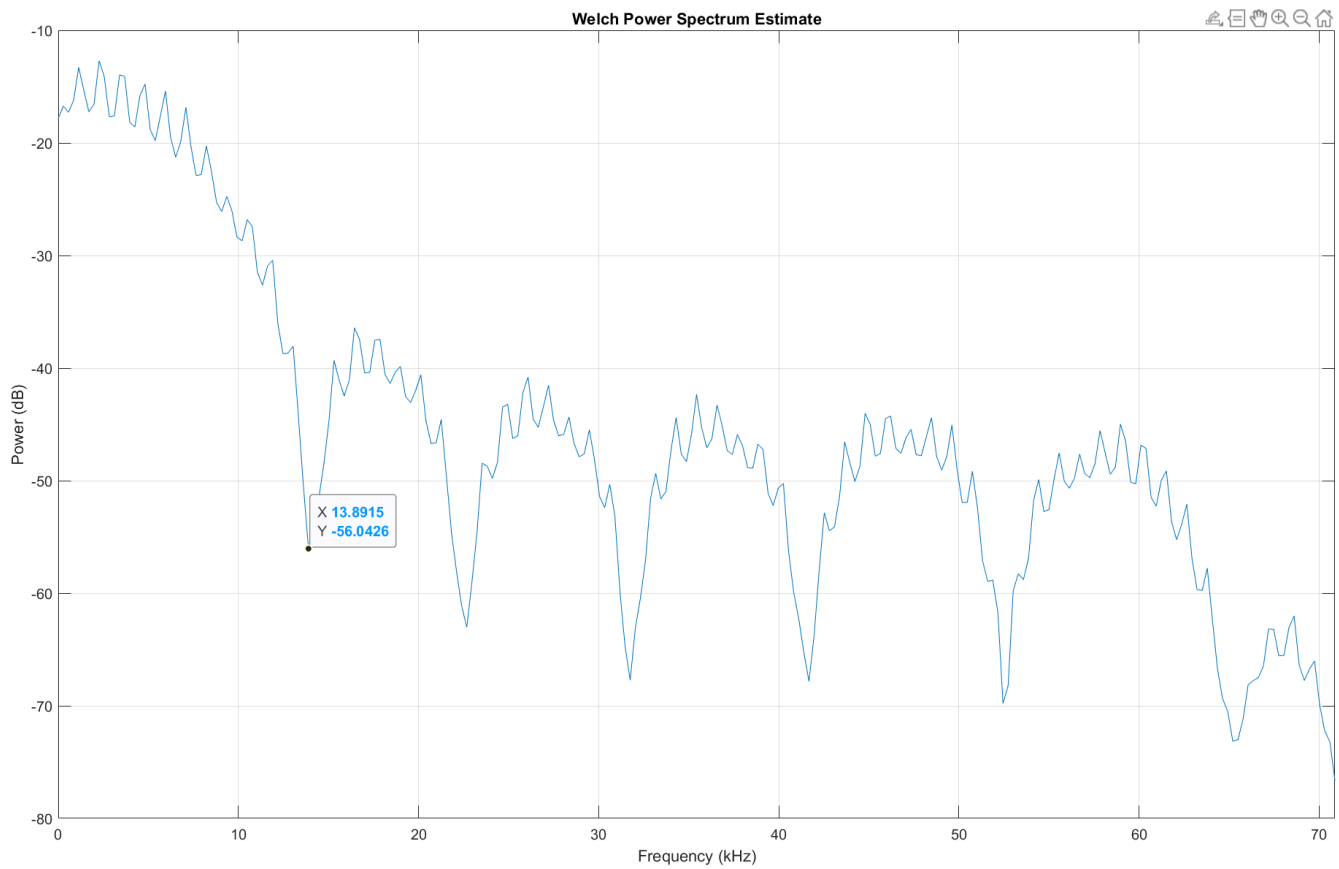
```
%pwelch(xPNRZ,500,300,500,Fs,'power');
%%wvtool(xPNRZ)
```

Ejercicio 7

```
pwelch(xPNRZ,500,300,500,Fs,'power');
```

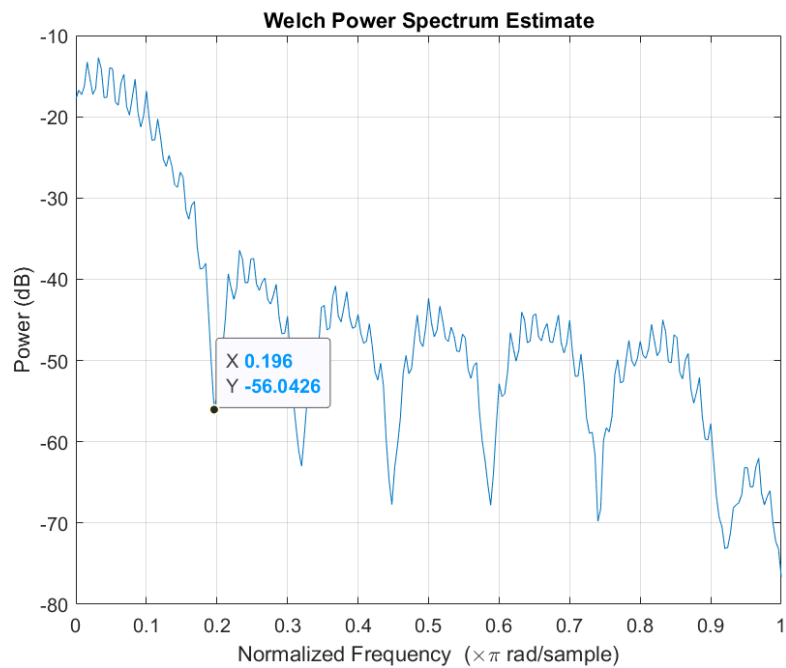


```
%% EL VALOR EN Hz DEL PRIMER NULO DEL ESPECTRO ES 13.8915 KHz
```



Ejercicio 8

```
pwelch(xPNRZ,500,300,500,'power');
```

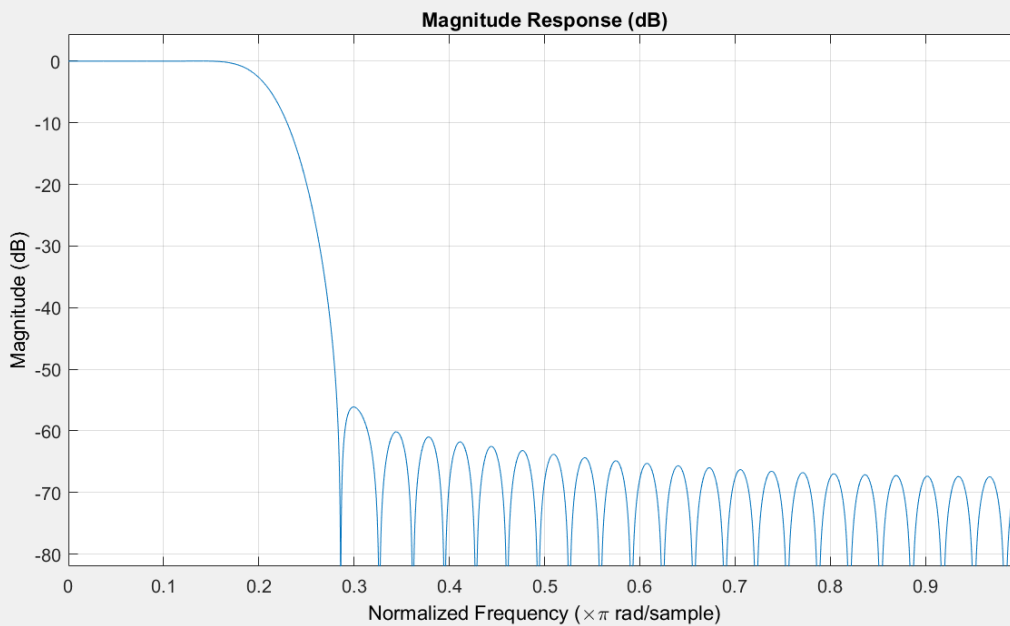


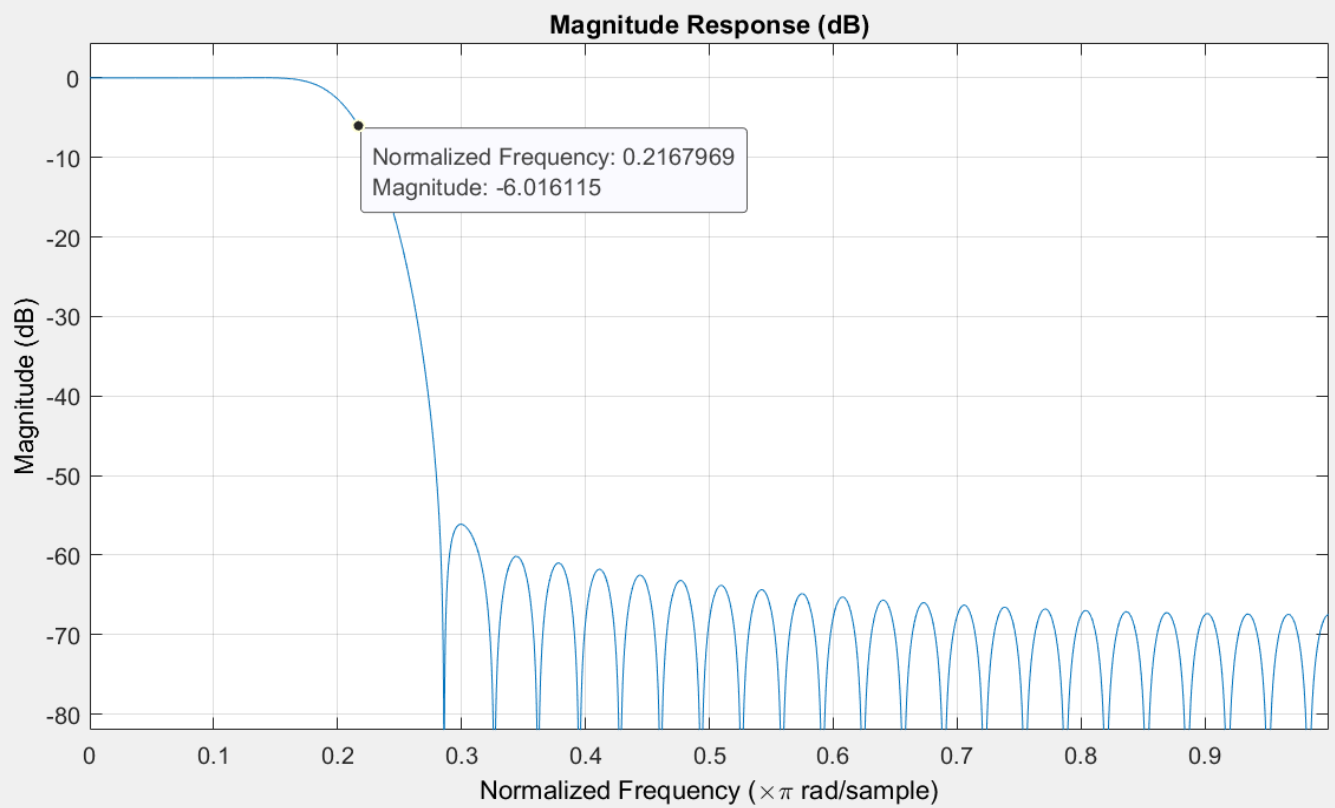
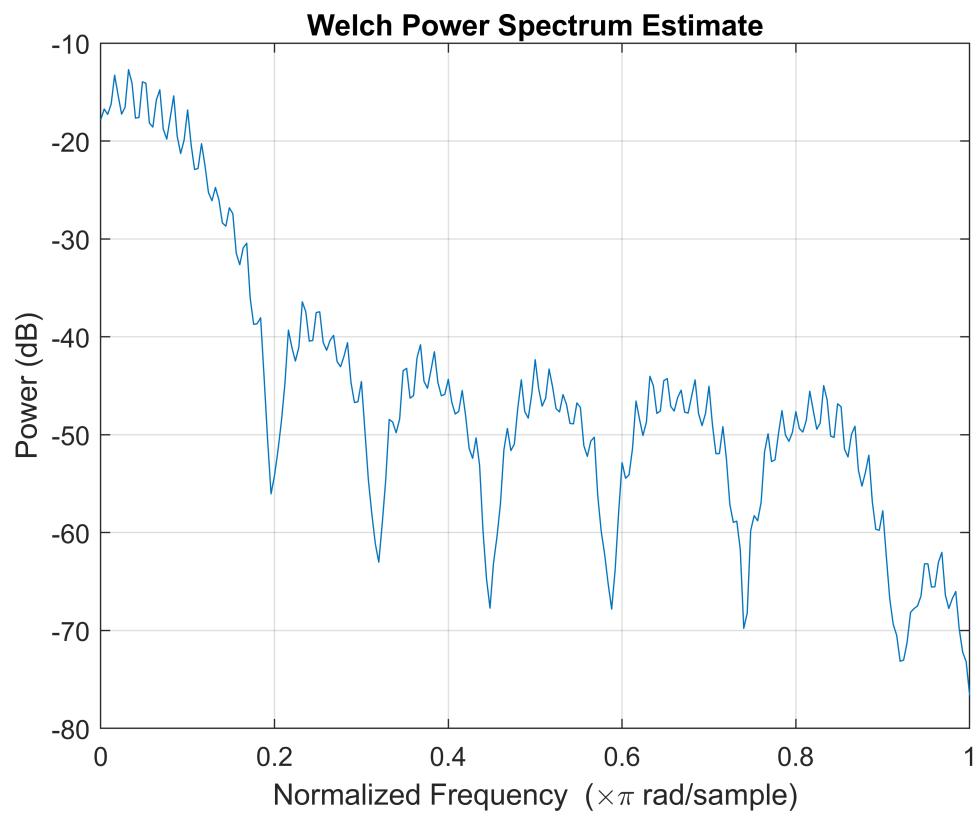
```
%%normalizado 0.196pi
```

```
Fc = 0.196 + 0.022
```

```
Fc = 0.2180
```

```
f = [0, Fc, Fc, 1];  
m = [1, 1, 0, 0];  
LPF = fir2(60, f, m);  
  
fvtool(LPF);
```





Ejercicio 9