Practica 1

Procesado Digital de la Señal (Universitat Politècnica de Catalunya)

```
>> load('sounds_2021.mat')
>> fs=44100

fs =

        44100

>> sound(echo_2021,fs)
>> plot(echo_2021(:,1))
```

: = totes les files | 1 =1 columna

plot(echo_2021,(fila,columna)

```
>> recObj= audiorecorder

recObj =

  audiorecorder with properties:

      SampleRate: 8000
    BitsPerSample: 8
      NumChannels: 1
         DeviceID: -1
    CurrentSample: 1
     TotalSamples: 0
          Running: 'off'
         StartFcn: []
          StopFcn: []
         TimerFcn: []
      TimerPeriod: 0.0500
              Tag: ''
         UserData: []
             Type: 'audiorecorder'
```

Com gravar un soroll i després reproduir-lo a una freqüencia fs determinada

```
>> te=audiorecorder(44100,16,1,-1);
```

Canviar únicament el primer paràmetre per a que fs=44100

```
>> recordblocking(te,5);
```

Gravar-me durant 5 segons la meva veu a una fs=44100

```
>> play(te);
```

```
>> x=getaudiodata(te)
```

obtenir el senyal gravat

```
function [x] = digital_to_analog(x,fs)

sound(x,fs)

end
```

```
function [x] = analog_to_digital(t,fs)
te = audiorecorder(fs,16,1,-1);
recordblocking(te,t);
x=getaudiodata(te);
end
```

```
function [y]=simple_echo_generation(x1,alfa,fs,delay_seg)

L=length(x1);
D=round(delay_seg*fs);
Y=zeros(L,1);

    for n=1:1:L
        if n<=D
            y(n)=x1(n);
        elseif n>D
            y(n)=x1(n)+alfa*x1(n-D);
        end
    end
end

function [y]=multiple_echoes_generation(x1,alfa,fs,delay_seg)

L=length(x1);
D=round(delay_seg*fs);
y=zeros(L,1);

    for n=1:1:L
        if n<=D
            y(n)=x1(n);
        elseif n>D
            y(n)=x1(n)+alfa*y(n-D);
        end
    end
end
```

```
function [z]=simple_echo_equalization(y1,alfa,fs,delay_seg)

L=length(y1);
D=round(delay_seg*fs);
z=zeros(L,1);

    for n=1:1:L
        if n<=D
            z(n)=y1(n);
        elseif n>D
            z(n)=y1(n)-alfa*z(n-D);
        end
    end
end
```

```
function [z]=multiple_echoes_equalization(y1,alfa,fs,delay_seg)

L=length(y1);
D=round(delay_seg*fs);
z=zeros(L,1);

    for n=1:1:L
        if n<=D
            z(n)=y1(n);
        elseif n>D
            z(n)=y1(n)-alfa*y1(n-D);
        end
    end
end
```