Digital signal processing Lab
Experiment-4

Codes:

Function_1 :-

```
function [y,sout] = filtered_env(x,f1,f2,Ts,s)
[b,a]=butter(2,[f1*Ts f2*Ts],'bandpass');
filtered_output=filter(b,a,x);
env=abs(hilbert(filtered_output));
[l_b,l_a]=butter(2,240*Ts,'low');
y=filter(l_b,l_a,env);
[b,a]=butter(2,[f1*Ts f2*Ts],'bandpass');
sout=filter(b,a,s);
y=y.*sout;
end
```

Function_2 :-

```
function read_audio(x,bands,Ts,Fs,s)
spacing=logspace(log10(90),log10(5760),bands+1);
y=filtered_env(x,spacing(1),spacing(2),Ts,s);
for i=2:bands
y=y+filtered_env(x,spacing(i),spacing(i+1),Ts,s);
end
audiowrite("audio_file_bands:"+bands+".wav",y,Fs);
end
```

Main function :-

```
clear;
[x,Fs]=audioread("fivewo.wav");
N=length(x);
Ts=1/Fs;
t=0:Ts:(N-1)*Ts;
bands=[1 2 3 4 8 16 128 512 1024];
s=randn(N,1);
%%
for j=1:length(bands)
read_audio(x,bands(j),Ts,Fs,s);
end
```

Results:-(in drive)

Audio files