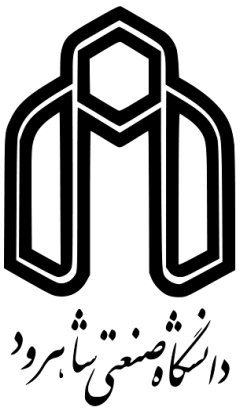
بسم الله الرحمن الرحیم



آزمایش ۳

نام استاد : جناب دکتر مقیمی

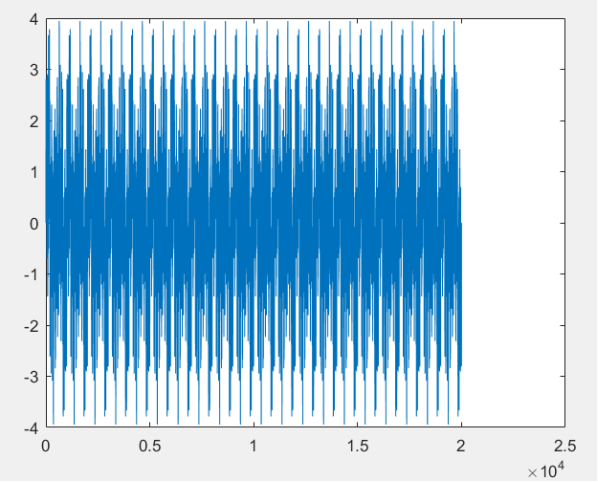
نام دانشجو : محمد توزنده جانی

۹۷۲۰۷۸۳

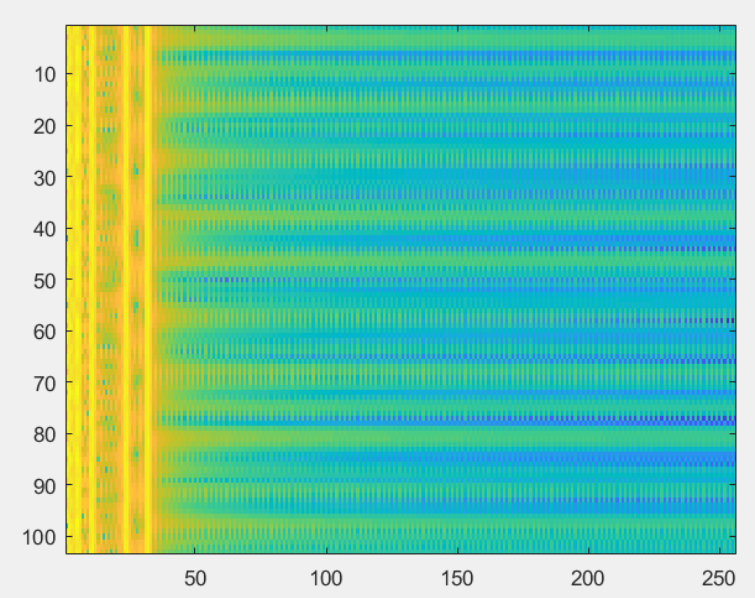
۱)

```
clc;
clear;
close all;
%% Create Signal
[f1,t1]=mysin(2,1000,20);
[f2,t2]=mysin(8,1000,20);
[f3,t3]=mysin(19,1000,20);
[f4,t4]=mysin(44,1000,20);
[f5,t5]=mysin(60,1000,20);
MySignal=f1+f2+f3+f4+f5;
figure(1)
plot(MySignal);

%% STFT

L=256;                          %Length of windows
R=round((1-0.25)*L);            %Overlap=25%

k=0;                            %Number of windows

while (k*R<(length(MySignal)-L))

    for j=1:L
        frame(k+1,j)=MySignal((k*R)+j);
    end
    k=k+1;
end

for i=1:size(frame,1)
    F(i,:)=abs(fft(frame(i,:),2*L));
end

figure(2)
imagesc(log10(F(:,1:256)));

figure(3)
spectrogram(MySignal);
```

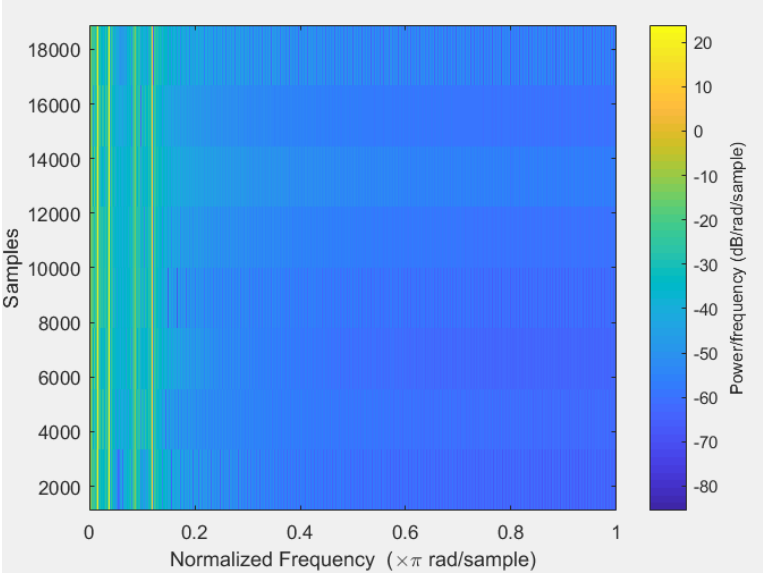
- سیگنال دلخواه ایجاد شده :



- خروجی نهایی کد : STFT



خروجی دستور Spectrogram :



قسمت ب)

```
clc;
clear;
close all;

%% Part02

%Define X(t)
fs=1e3;
ts=1/fs;
t=0:ts:10;

if 0<t<2.5
    x=cos(2*pi*10*t);
end

if 2.5<t<5
    x=cos(2*pi*10*t);
end

if 5<t<7.5
    x=cos(2*pi*10*t);
end

if 7.5<t<10
    x=cos(2*pi*10*t);
end

L=256;                          %Length of windows
R=round((1-0.25)*L);            %Overlap=25%

k=0;                            %Number of windows

while (k*R<(length(x)-L))

    for j=1:L
        frame(k+1,j)=x((k*R)+j);
    end
    k=k+1;
end

for i=1:size(frame,1)
    F(i,:)=abs(fft(frame(i,:),2*L));
end

figure(4)
imagesc(log10(F(:,1:256)));

figure(5)
spectrogram(x);
```

خروجی نهایی کد :