LAMPIRAN

Script time domain 1000 & 1200 rpm gabungan

```
clear
clc
close

load('D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1000RPMSR52000\Normal1000RP
MSR52000bearing15.mat')
y1=data_all(:,1);
load('D:\fanani\KULIAH\jurnal TA\DATA PENELITIAN\FANANI\OUTER\data
rusak spektrum dan
envelope\Outer1000RPM\Outer1000RPMbearing15.mat')
y2=data_all(:,1);
sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %waktu perekaman data (recording time)
L=sampling_rate*recording_time;  %panjang data (length of signal)

load('D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1200RPMbaru\Normal1200RPMbe
aring15.mat')
y3=data_all(:,1);
load('D:\fanani\KULIAH\jurnal TA\DATA PENELITIAN\FANANI\OUTER\data
rusak spektrum dan
envelope\Outer1200RPM\Outer1200RPMbearing15.mat')
y4=data_all(:,1);
sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %waktu perekaman data (recording time)
L=sampling_rate*recording_time;  %panjang data (length of signal)


% plot amplitude time domain
Figure %membuat tampilan grafik/suatu gambar
subplot(2,2,1) %membuat jumlah grafik plot dalam satu figure,(2
baris,2 kolom, urutan 1) mengurutkan grafik harus dari kiri
kekanan sesuai barisan.
plot(y1(1:51200)) %data yang ingin di plot, memanggil input
axis([0 9588 -60 60]) %skala axis x(0-9588) dan skala axis y(-60-
60)
title('a') %penamaan grafik pada sisi tengah atas
xlabel('sampel') %penamaan grafik pada axis x
ylabel('Amplitudo (mV)') %penamaan grafik pada axis y
subplot(2,2,2) %membuat jumlah grafik plot dalam satu figure,(2
baris,2 kolom, urutan 2) mengurutkan grafik harus dari kiri
kekanan sesuai barisan.
plot(y2(1:51200)) %data yang ingin di plot, memanggil input
axis ([0 9588 -60 60]) %skala axis x(0-9588) dan skala axis y(-60-
60)
title('b') %penamaan grafik pada sisi tengah atas
xlabel('sampel') %penamaan grafik pada axis x
ylabel('Amplitudo (mV)') %penamaan grafik pada axis y
```

```
% plot amplitude time domain
subplot(2,2,3)
plot(y3(1:51200))
axis([0 7962 -60 60])
title('c')
xlabel('sampel')
ylabel('Amplitudo (mV)')
subplot(2,2,4)
plot(y4(1:51200))
axis ([0 7962 -60 60])
title('d')
xlabel('sampel')
ylabel('Amplitudo (mV)')
% Plot single-sided amplitude spectrum.
```

Script time domain 1400 & 1600 rpm

```
clear
clc
close

load('D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1400RPMSR52000\Normal1400RP
MSR52000bearing15.mat')
y1=data_all(:,1);
load('D:\fanani\KULIAH\jurnal TA\DATA PENELITIAN\FANANI\OUTER\data
rusak spektrum dan
envelope\Outer1400RPMNew\Outer1400RPMNewbearing15.mat')
y2=data_all(:,1);
sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %waktu perekaman data (recording time)
L=sampling_rate*recording_time;  %panjang data (length of signal)




load('D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1600RPMSR52000\Normal1600RP
MSR52000bearing20.mat')
y3=data_all(:,1);
load('D:\fanani\KULIAH\jurnal TA\DATA PENELITIAN\FANANI\OUTER\data
rusak spektrum dan
envelope\Outer1600RPMNew\Outer1600RPMNewbearing20.mat')
y4=data_all(:,1);
sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %waktu perekaman data (recording time)
L=sampling_rate*recording_time;  %panjang data (length of signal)


% plot amplitude time domain
figure
subplot(2,2,1)
plot(y1(1:51200))
axis([0 6854 -20 20])
```

```
title('a')
xlabel('sampel')
ylabel('Amplitudo (mV)')
subplot(2,2,2)
plot(y2(1:51200))
axis ([0 6854 -20 20])
title('b')
xlabel('sampel')
ylabel('Amplitudo (mV)')


% plot amplitude time domain
subplot(2,2,3)
plot(y3(1:51200))
axis([0 6037 -25 25])
title('c')
xlabel('sampel')
ylabel('Amplitudo (mV)')
subplot(2,2,4)
plot(y4(1:51200))
axis ([0 6037 -25 25])
title('d')
xlabel('sampel')
ylabel('Amplitudo (mV)')
```

Grafik statistik domain waktu 1000 rpm rusak dan normal

RMS, STD, KURTOSIS, VARIANCE

```
clear
clc
close all
for d=1:30 %jumlah sampel data yang digunakan
   signal_in=['D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1000RPMSR52000\Normal1000RP
MSR52000bearing',int2str(d),'.mat'];
load (signal_in)
a=data_all(:,1);
Y1(d)=rms(a); %rumus "root mean square", sudah terinstal pada
matlab, tinggal melakukan pemanggilan dengan mengetikkan kode
function
s1(d)=std(a); %rumus "standard deviation", sudah terinstal pada
matlab, tinggal melakukan pemanggilan dengan mengetikkan kode
function
k1(d)=kurtosis(a); %rumus "kurtosis", sudah terinstal pada matlab,
tinggal melakukan pemanggilan dengan mengetikkan kode function
V1(d)=var(a); %rumus "variance", sudah terinstal pada matlab,
tinggal melakukan pemanggilan dengan mengetikkan kode function
x1=1:30;
end

for d=1:30
   signal_in=['D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\OUTER\data rusak spektrum dan
envelope\Outer1000RPM\Outer1000RPMbearing',int2str(d),'.mat'];
load (signal_in)
```

```
a=data_all(:,1);
Y2(d)=rms(a);
s2(d)=std(a);
k2(d)=kurtosis(a);
V2(d)=var(a);
x2=1:30;
end

figure
s=30; %kode function size (ukuran)titik-titik point pada grafik
scatter
c='b'; %kode function color (warna) titik-titik point pada grafik
scatter
subplot(2,2,1);
scatter(x1,(Y1),s,c,'fill');%function untuk membuat grafik scatter,
function "fill" menunjukkan bahwa titik-titik point pada scatter
diberi warna secara utuh bukan hanya sisi pinggirnya.
hold on %mengikat sebuah data plot,agar dapat digabungkan dalam
satu grafik plot, sehingga dapat dilihat perbedaannya.
s=30;
c='r'
scatter(x2,(Y2),s,c,'fill');
title('Grafik (a)')
xlabel('sampel')
ylabel('RMS(mV)')


s=30;
c='b';
subplot(2,2,2);
scatter(x1,(s1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(s2),s,c,'fill');
title('Grafik (b)')
xlabel('sampel')
ylabel('STD(mV)')

s=30;
c='b';
subplot(2,2,3);
scatter(x1,(k1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(k2),s,c,'fill');
title('Grafik (c)')
xlabel('sampel')
ylabel('Kurtosis')

s=30;
c='b';
subplot(2,2,4);
scatter(x1,(V1),s,c,'fill');
hold on
```

```
s=30;
c='r'
scatter(x2,(V2),s,c,'fill');
title('Grafik (d)')
xlabel('sampel')
ylabel('Variance(mV)')
```

MEAN, SKEWNESS

```
clear
clc
close all
for d=1:30
   signal_in=['D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1000RPMSR52000\Normal1000RP
MSR52000bearing',int2str(d),'.mat'];
load (signal_in)
a=data_all(:,1);
M1(d)=mean(a); %rumus "mean", sudah terinstal pada matlab, tinggal
melakukan pemanggilan dengan mengetikkan kode function
y1(d)=skewness(a); %rumus "skewness", sudah terinstal pada matlab,
tinggal melakukan pemanggilan dengan mengetikkan kode function
x1=1:30;
end

for d=1:30
   signal_in=['D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\OUTER\data rusak spektrum dan
envelope\Outer1000RPM\Outer1000RPMbearing',int2str(d),'.mat'];
load (signal_in)
a=data_all(:,1);
M2(d)=mean(a);
y2(d)=skewness(a);
x2=1:30;
end

figure
s=30;
c='b';
subplot(2,1,1);
scatter(x1,(M1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(M2),s,c,'fill');
title('Grafik (a)')
xlabel('sampel')
ylabel('Mean(mV)')


s=30;
c='b';
subplot(2,1,2);
scatter(x1,(y1),s,c,'fill');
hold on
```

```
s=30;
c='r'
scatter(x2,(y2),s,c,'fill');
title('Grafik (b)')
xlabel('sampel')
ylabel('Skewness')
```

Grafik statistik domain waktu 1200 rpm rusak dan normal

RMS, STD, KURTOSIS, VARIANCE

```
clear
clc
close all
for d=1:30
   signal_in=['D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1200RPMbaru\Normal1200RPMbe
aring',int2str(d),'.mat'];
load (signal_in)
a=data_all(:,1);
Y1(d)=rms(a);
s1(d)=std(a);
k1(d)=kurtosis(a);
V1(d)=var(a);
x1=1:30;
end

for d=1:30
   signal_in=['D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\OUTER\data rusak
statistik\Outer1200RPMsta\Outer1200RPMbearingm',int2str(d),'.mat']
;
load (signal_in)
a=data_all(:,1);
Y2(d)=rms(a);
s2(d)=std(a);
k2(d)=kurtosis(a);
V2(d)=var(a);
x2=1:30;
end

figure
s=30;
c='b';
subplot(2,2,1);
scatter(x1,(Y1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(Y2),s,c,'fill');
title('Grafik (a)')
xlabel('sampel')
ylabel('RMS(mV)')

s=30;
c='b';
```

```
subplot(2,2,2);
scatter(x1,(s1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(s2),s,c,'fill');
title('Grafik (b)')
xlabel('sampel')
ylabel('STD(mV)')

s=30;
c='b';
subplot(2,2,3);
scatter(x1,(k1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(k2),s,c,'fill');
title('Grafik (c)')
xlabel('sampel')
ylabel('Kurtosis')

s=30;
c='b';
subplot(2,2,4);
scatter(x1,(V1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(V2),s,c,'fill');
title('Grafik (d)')
xlabel('sampel')
ylabel('Variance(mV)')
```

MEAN, SKEWNESS

```
clear
clc
close all
for d=1:30
   signal_in=['D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1200RPMbaru\Normal1200RPMbe
aring',int2str(d),'.mat'];
load (signal_in)
a=data_all(:,1);
M1(d)=mean(a);
y1(d)=skewness(a);
x1=1:30;
end

for d=1:30
   signal_in=['D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\OUTER\data rusak
statistik\Outer1200RPMsta\Outer1200RPMbearingm',int2str(d),'.mat']
;
```

```
load (signal_in)
a=data_all(:,1);
M2(d)=mean(a);
y2(d)=skewness(a);
x2=1:30;
end

figure
s=30;
c='b';
subplot(2,1,1);
scatter(x1,(M1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(M2),s,c,'fill');
title('Grafik (a)')
xlabel('sampel')
ylabel('Mean(mV)')

s=30;
c='b';
subplot(2,1,2);
scatter(x1,(y1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(y2),s,c,'fill');
title('Grafik (b)')
xlabel('sampel')
ylabel('Skewness')
```

Grafik statistik domain waktu 1400 rpm rusak dan normal

RMS, STD, KURTOSIS, VARIANCE

```
clear
clc
close all
for d=1:30
   signal_in=['D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1400RPMSR52000\Normal1400RP
MSR52000bearing',int2str(d),'.mat'];
load (signal_in)
a=data_all(:,1);
Y1(d)=rms(a);
s1(d)=std(a);
k1(d)=kurtosis(a);
V1(d)=var(a);
x1=1:30;
end

for d=1:30
   signal_in=['D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\OUTER\data rusak spektrum dan
```

```
envelope\Outer1400RPMNew\Outer1400RPMNewbearing',int2str(d),'.mat'
];
load (signal_in)
a=data_all(:,1);
Y2(d)=rms(a);
s2(d)=std(a);
k2(d)=kurtosis(a);
V2(d)=var(a);
x2=1:30;
end

figure
s=30;
c='b';
subplot(2,2,1);
scatter(x1,(Y1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(Y2),s,c,'fill');
title('Grafik (a)')
xlabel('sampel')
ylabel('RMS(mV)')

s=30;
c='b';
subplot(2,2,2);
scatter(x1,(s1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(s2),s,c,'fill');
title('Grafik (b)')
xlabel('sampel')
ylabel('STD(mV)')

s=30;
c='b';
subplot(2,2,3);
scatter(x1,(k1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(k2),s,c,'fill');
title('Grafik (c)')
xlabel('sampel')
ylabel('Kurtosis')

s=30;
c='b';
subplot(2,2,4);
scatter(x1,(V1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(V2),s,c,'fill');
```

```
title('Grafik (d)')
xlabel('sampel')
ylabel('Variance(mV)')
```

MEAN, SKEWNESS

```
clear
clc
close all
for d=1:30
   signal_in=['D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1400RPMSR52000\Normal1400RP
MSR52000bearing',int2str(d),'.mat'];
load (signal_in)
a=data_all(:,1);
M1(d)=mean(a);
y1(d)=skewness(a);
x1=1:30;
end

for d=1:30
   signal_in=['D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\OUTER\data rusak spektrum dan
envelope\Outer1400RPMNew\Outer1400RPMNewbearing',int2str(d),'.mat'
];
load (signal_in)
a=data_all(:,1);
M2(d)=mean(a);
y2(d)=skewness(a);
x2=1:30;
end

figure
s=30;
c='b';
subplot(2,1,1);
scatter(x1,(M1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(M2),s,c,'fill');
title('Grafik (a)')
xlabel('sampel')
ylabel('Mean(mV)')

s=30;
c='b';
subplot(2,1,2);
scatter(x1,(y1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(y2),s,c,'fill');
title('Grafik (b)')
xlabel('sampel')
```

```
ylabel('Skewness')
```

Grafik statistik domain waktu 1600 rpm rusak dan normal

RMS, STD, KURTOSIS, VARIANCE

```
clear
clc
close all
for d=1:30
   signal_in=['D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1600RPMSR52000\Normal1600RP
MSR52000bearing',int2str(d),'.mat'];
load (signal_in)
a=data_all(:,1);
Y1(d)=rms(a);
s1(d)=std(a);
k1(d)=kurtosis(a);
V1(d)=var(a);
x1=1:30;
end

for d=1:30
   signal_in=['D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\OUTER\data rusak
statistik\Outer1600RPMNewsta\Outer1600RPMNewbearingm',int2str(d),'
.mat'];
load (signal_in)
a=data_all(:,1);
Y2(d)=rms(a);
s2(d)=std(a);
k2(d)=kurtosis(a);
V2(d)=var(a);
x2=1:30;
end

figure
s=30;
c='b';
subplot(2,2,1);
scatter(x1,(Y1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(Y2),s,c,'fill');
title('Grafik (a)')
xlabel('sampel')
ylabel('RMS(mV)')

s=30;
c='b';
subplot(2,2,2);
```

```
scatter(x1,(s1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(s2),s,c,'fill');
title('Grafik (b)')
xlabel('sampel')
ylabel('STD(mV)')

s=30;
c='b';
subplot(2,2,3);
scatter(x1,(k1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(k2),s,c,'fill');
title('Grafik (c)')
xlabel('sampel')
ylabel('Kurtosis')

s=30;
c='b';
subplot(2,2,4);
scatter(x1,(V1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(V2),s,c,'fill');
title('Grafik (d)')
xlabel('sampel')
ylabel('Variance(mV)')
```

MEAN, SKEWNESS

```
clear
clc
close all
for d=1:30
   signal_in=['D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1600RPMSR52000\Normal1600RP
MSR52000bearing',int2str(d),'.mat'];
load (signal_in)
a=data_all(:,1);
M1(d)=mean(a);
y1(d)=skewness(a);
x1=1:30;
end

for d=1:30
   signal_in=['D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\OUTER\data rusak
statistik\Outer1600RPMNewsta\Outer1600RPMNewbearingm',int2str(d),'
.mat'];
load (signal_in)
a=data_all(:,1);
```

```
M2(d)=mean(a);
y2(d)=skewness(a);
x2=1:30;
end

figure
s=30;
c='b';
subplot(2,1,1);
scatter(x1,(M1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(M2),s,c,'fill');
title('Grafik (a)')
xlabel('sampel')
ylabel('Mean(mV)')

s=30;
c='b';
subplot(2,1,2);
scatter(x1,(y1),s,c,'fill');
hold on
s=30;
c='r'
scatter(x2,(y2),s,c,'fill');
title('Grafik (b)')
xlabel('sampel')
ylabel('Skewness')
```

SPEKTRUM & ENVELOPE 1000 RPM

```
clear
clc
close

load('D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1000RPMSR52000\Normal1000RP
MSR52000bearing15.mat')
y1=data_all(:,1);
load('D:\fanani\KULIAH\jurnal TA\DATA PENELITIAN\FANANI\OUTER\data
rusak spektrum dan
envelope\Outer1000RPM\Outer1000RPMbearing15.mat')
y2=data_all(:,1);
sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %waktu perekaman data (recording time)
L=sampling_rate*recording_time;  %panjang data (length of signal)

NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y1 = fft(y1,NFFT)/L
```

```
f = sampling_rate/2*linspace(0,1,NFFT/2+1);
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y2 = fft(y2,NFFT)/L
f = sampling_rate/2*linspace(0,1,NFFT/2+1);


% Plot single-sided amplitude spectrum.
figure
subplot(2,1,1)
plot(f,2*abs(Y1(1:NFFT/2+1)))
axis([0 1500 0 0.15])
title('a')
xlabel('Frequency (Hz)')
ylabel('Amplitudo (mV)')
subplot(2,1,2)
plot(f,2*abs(Y2(1:NFFT/2+1)))
axis ([0 1500 0 0.15])
title('b')
xlabel('Frequency (Hz)')
ylabel('Amplitudo (mV)')



%envelope normal
load('D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1000RPMSR52000\Normal1000RP
MSR52000bearing15.mat')
y=data_all(:,1);
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n=sig_f/(norm(sig_f));
freq_s=(0:L-1)/T;
figure
subplot(2,1,1)
plot(freq_s,sig_n);
axis([0 1500 0 0.35])
title('a')
xlabel('Frequency (Hz)')
ylabel('Amplitudo (mV)')

%envelope outer
load('D:\fanani\KULIAH\jurnal TA\DATA PENELITIAN\FANANI\OUTER\data
rusak spektrum dan
envelope\Outer1000RPM\Outer1000RPMbearing15.mat')
y=data_all(:,1);
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n=sig_f/(norm(sig_f));
freq_s=(0:L-1)/T;
subplot(2,1,2)
plot(freq_s,sig_n);
axis([0 1500 0 0.35])
```

```
title('b')
xlabel('Frequency (Hz)')
ylabel('Amplitudo (mV)')
```

SPEKTRUM & ENVELOPE 1200 RPM

```
clear
clc
close

load('D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1200RPMbaru\Normal1200RPMbe
aring15.mat')
y1=data_all(:,1);
load('D:\fanani\KULIAH\jurnal TA\DATA PENELITIAN\FANANI\OUTER\data
rusak spektrum dan
envelope\Outer1200RPM\Outer1200RPMbearing15.mat')
y2=data_all(:,1);
sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %waktu perekaman data (recording time)
L=sampling_rate*recording_time;  %panjang data (length of signal)

NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y1 = fft(y1,NFFT)/L
f = sampling_rate/2*linspace(0,1,NFFT/2+1);
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y2 = fft(y2,NFFT)/L
f = sampling_rate/2*linspace(0,1,NFFT/2+1);


% Plot single-sided amplitude spectrum.
figure
subplot(2,1,1)
plot(f,2*abs(Y1(1:NFFT/2+1)))
axis([0 1500 0 0.08])
title('a')
xlabel('Frequency (Hz)')
ylabel('Amplitudo (mV)')
subplot(2,1,2)
plot(f,2*abs(Y2(1:NFFT/2+1)))
axis ([0 1500 0 0.08])
title('b')
xlabel('Frequency (Hz)')
ylabel('Amplitudo (mV)')

%envelope normal
load('D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1200RPMbaru\Normal1200RPMbe
aring15.mat')
y=data_all(:,1);
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n=sig_f/(norm(sig_f));
```

```
freq_s=(0:L-1)/T;
figure
subplot(2,1,1)
plot(freq_s,sig_n);
axis([0 1500 0 0.15])
title('a')
xlabel('Frequency (Hz)')
ylabel('Amplitudo (mV)')

%envelope outer
load('D:\fanani\KULIAH\jurnal TA\DATA PENELITIAN\FANANI\OUTER\data
rusak spektrum dan
envelope\Outer1200RPM\Outer1200RPMbearing15.mat')
y=data_all(:,1);
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n=sig_f/(norm(sig_f));
freq_s=(0:L-1)/T;
subplot(2,1,2)
plot(freq_s,sig_n);
axis([0 1500 0 0.15])
title('b')
xlabel('Frequency (Hz)')
ylabel('Amplitudo (mV)')
```

SPEKTRUM & ENVELOPE 1400 RPM

```
clear
clc
close

load('D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1400RPMSR52000\Normal1400RP
MSR52000bearing15.mat')
y1=data_all(:,1);
load('D:\fanani\KULIAH\jurnal TA\DATA PENELITIAN\FANANI\OUTER\data
rusak spektrum dan
envelope\Outer1400RPMNew\Outer1400RPMNewbearing15.mat')
y2=data_all(:,1);
sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %waktu perekaman data (recording time)
L=sampling_rate*recording_time;  %panjang data (length of signal)

NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y1 = fft(y1,NFFT)/L
```

```
f = sampling_rate/2*linspace(0,1,NFFT/2+1);
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y2 = fft(y2,NFFT)/L
f = sampling_rate/2*linspace(0,1,NFFT/2+1);

% Plot single-sided amplitude spectrum.
figure
subplot(2,1,1)
plot(f,2*abs(Y1(1:NFFT/2+1)))
axis([0 1500 0 0.08])
title('a')
xlabel('Frequency (Hz)')
ylabel('Amplitudo (mV)')
subplot(2,1,2)
plot(f,2*abs(Y2(1:NFFT/2+1)))
axis ([0 1500 0 0.08])
title('b')
xlabel('Frequency (Hz)')
ylabel('Amplitudo (mV)')

%envelope normal
load('D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1400RPMSR52000\Normal1400RP
MSR52000bearing15.mat')
y=data_all(:,1);
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n=sig_f/(norm(sig_f));
freq_s=(0:L-1)/T;
figure
subplot(2,1,1)
plot(freq_s,sig_n);
axis([0 1500 0 0.15])
title('a')
xlabel('Frequency (Hz)')
ylabel('Amplitudo (mV)')

%envelope outer
load('D:\fanani\KULIAH\jurnal TA\DATA PENELITIAN\FANANI\OUTER\data
rusak spektrum dan
envelope\Outer1400RPMNew\Outer1400RPMNewbearing15.mat')
y=data_all(:,1);
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n=sig_f/(norm(sig_f));
freq_s=(0:L-1)/T;
subplot(2,1,2)
plot(freq_s,sig_n);
axis([0 1500 0 0.15])
title('b')
xlabel('Frequency (Hz)')
ylabel('Amplitudo (mV)')
```

SPEKTRUM & ENVELOPE 1600 RPM

```
clear
clc
close

load('D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1600RPMSR52000\Normal1600RP
MSR52000bearing20.mat')
y1=data_all(:,1);
load('D:\fanani\KULIAH\jurnal TA\DATA PENELITIAN\FANANI\OUTER\data
rusak spektrum dan
envelope\Outer1600RPMNew\Outer1600RPMNewbearing20.mat')
y2=data_all(:,1);
sampling_rate=51200; %kecepatan sampling Hz
recording_time=20;   %waktu perekaman data (recording time)
L=sampling_rate*recording_time;  %panjang data (length of signal)

NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y1 = fft(y1,NFFT)/L
f = sampling_rate/2*linspace(0,1,NFFT/2+1);
NFFT = 2^nextpow2(L); % Next power of 2 from length of y
Y2 = fft(y2,NFFT)/L
f = sampling_rate/2*linspace(0,1,NFFT/2+1);


% Plot single-sided amplitude spectrum.
figure
subplot(2,1,1)
plot(f,2*abs(Y1(1:NFFT/2+1)))
axis([0 1800 0 0.025])
title('a')
xlabel('Frequency (Hz)')
ylabel('Amplitudo (mV)')
subplot(2,1,2)
plot(f,2*abs(Y2(1:NFFT/2+1)))
axis ([0 1800 0 0.025])
title('b')
xlabel('Frequency (Hz)')
ylabel('Amplitudo (mV)')



%envelope normal
load('D:\fanani\KULIAH\jurnal TA\DATA
PENELITIAN\FANANI\BEARING_NORMAL\Normal1600RPMSR52000\Normal1600RP
MSR52000bearing20.mat')
y=data_all(:,1);
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n=sig_f/(norm(sig_f));
freq_s=(0:L-1)/T;
```

```
figure
subplot(2,1,1)
plot(freq_s,sig_n);
axis([0 1800 0 0.25])
title('a')
xlabel('Frequency (Hz)')
ylabel('Amplitudo (mV)')

%envelope outer
load('D:\fanani\KULIAH\jurnal TA\DATA PENELITIAN\FANANI\OUTER\data
rusak spektrum dan
envelope\Outer1600RPMNew\Outer1600RPMNewbearing20.mat')
y=data_all(:,1);
analy=hilbert(data_all);
y=abs(analy);
T=recording_time;
sig_f=abs(fft(y(1:L)',L));
sig_n=sig_f/(norm(sig_f));
freq_s=(0:L-1)/T;
subplot(2,1,2)
plot(freq_s,sig_n);
axis([0 1800 0 0.25])
title('b')
xlabel('Frequency (Hz)')
ylabel('Amplitudo (mV)')
```